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VIPNET NEWS

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Inside
विशेष लेख

खाद्य पदार्थों में मिलावट की जांच

अंतरराष्ट्रीय रसायन विज्ञान वर्ष-2011 का मुख्य उद्देश्य दैनिक जीवन में रसायन विज्ञान के उपयोग को समझना है। इस वर्ष को मनाने का सबसे अच्छा तरीका यही होगा कि हम दैनिक आहार में होने वाली मिलावट का पता लगाएं। यह हम सभी जानते हैं कि अगर हम जरा सी सावधानी और समय-समय पर खाद्य पदार्थों की जांच करते रहे तो हम न अपने स्वास्थ्य की रक्षा करेंगे बल्कि समाज में फैली एक सामाजिक बुराई का भी अन्त करने में सफल होंगे। इस लेख में हम रोजमर्रा के उपयोग में आने वाली सामग्री में मिलावट की जांच एवं उनके परिक्षण के सिद्धांतों की जानकारी दे रहे हैं। हमें आशा है कि ये जानकारी हमारे विपनेट क्लबों के लिये उपयोगी सिद्ध होगी, विशेषकर उन क्लबों के लिए जो अन्तरराष्ट्रीय कैम्प के लिए परियोजना तैयार कर रहे हैं।

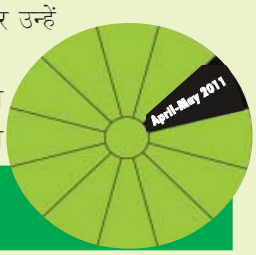
अनेक विकाशील देशों की तरह भारत में भी अधिकतर परिवारों के बजट का मोटा हिस्सा उनके आहार पर खर्च होता है। इसलिए सभी लोग कम मूल्य पर अधिकतम खाद्यान्न को प्राप्त करना चाहते हैं। दूसरी ओर प्रत्येक व्यापारी और निर्माता अधिकतम मुनाफा कमाना चाहते हैं। यह अंतरविरोध ही विभिन्न समस्याओं का कारण बनता है, जिसके कारण आम लोगों को खाने-पीने की शुद्ध वस्तु प्राप्त नहीं होती एवं उन्हें जो मिलता है उसमें कुछ अन्य सस्ती सामग्री को मिला दिया जाता है या उस सामग्री के महत्वपूर्ण घटक को कम कर दिया जाता है।

खाद्य पदार्थों में मिलावट करना न केवल एक सामाजिक बुराई है बल्कि अपराध भी है

खाद्य पदार्थों में मिलावट करना न केवल एक सामाजिक बुराई है बल्कि अपराध भी है। मिलावटी खाद्य पदार्थ हमारे स्वास्थ्य को भी नुकसान पहुँचाते हैं। हां, मिलावटी खाद्य पदार्थों का असर हमें तुरन्त दिखाई नहीं देता जैसा कि विषैला पदार्थ खाने से होता है। मिलावटी खाद्य पदार्थों का असर दिखाई देने में कुछ घंटे से लेकर कई वर्षों तक लग सकते हैं।

अक्सर ऐसा देखने में आता है कि खाद्य पदार्थ में मिलावट के मामले अक्सर शहरों में जहां आर्थिक रुप से कम सम्पन्न लोग रहते हैं या ग्रामीण क्षेत्रों में अधिक देखने को मिलते हैं। हालांकि, मिलावट पर रोक के लिये स्वास्थ्य विभाग के अलावा कई कानून भी हैं, परन्तु आम जनता इस विषय को लेकर न केवल उदासीनता है बल्कि उनके पास पूर्ण जानकारी का भी अभाव है। इसी कारण नुकसान उठाने के बाद भी लोग उपभोक्ता सरंक्षण जैसे कानूनों का सहारा नहीं ले पाते। मिलावटी खाद्य पदार्थों का सेवन करने से हमारे स्वास्थ्य पर क्या प्रतिकूल प्रभाव पड़ता है तथा मिलावट की जांच किस प्रकार की जा सकती है, यह जानना हम सबके लिए आवश्यक है अन्यथा मिलावटी खाद्य सामग्री का उपभोग करने से हमारे स्वास्थ्य पर प्रतिकूल प्रभाव पड़ सकता है। इसी बात को हमारे विज्ञान क्लब विभिन्न गतिविधियों, प्रदर्शनों तथा व्याख्यानों द्वारा आम जनता तक पहुँचा कर उन्हें जागरुक बना सकते हैं।

खाद्य पदार्थों में मिलावट के कई तरीके हो सकते हैं जैसा किसी पदार्थ में लाभ के लिए किसी अन्य सस्ती सामग्री की मिलावट करना। खाद्य सामग्री के किसी किमती



अंतरराष्ट्रीय रसायन विज्ञान वर्ष-2011
रसायन विज्ञान - हमारा जीवन हमारा भविष्य

विज्ञान क्लबों को क्या करना है

विज्ञान क्लबों को खाद्य सामग्री में मिलावट के विरुद्ध दो माह तक एक जन-आन्दोलन का आयोजन करना है, जिसके मुख्य घटक निम्न होंगे :-

- **जनमानस में मिलावट के विरुद्ध जागरुकता को विकसित करना व खाद्य सामग्री में मिलावट की जांच करना तथा प्राप्त हुए परिणामों को आम जनता के साथ साझा करना।**
- **अभियान के दौरान खाद्य सामग्री में मिलावट जैसे विषय पर गतिविधियों, प्रदर्शनों तथा व्याख्यानों का आयोजन करना।**
- **खाद्य पदार्थों में मिलावट के लिए उपयोग किए जाने वाले विभिन्न पदार्थों को जनमानस के मध्य प्रदर्शित कर उन पदार्थों से स्वास्थ्य पर पड़ने वाले नकारात्मक प्रभावों को व्यक्त करना।**

घटक को हटा देना या कम कर देना, गुणवत्ता कम कर देना। खराब हो चुकी सामग्री को बेचना। यहां एक अन्य रोचक तथ्य है कि प्रत्येक वस्तु में एक या कुछ विशेष पदार्थों की मिलावट की जा सकती है। इस स्थिति के दो ही परिणाम होते हैं जिसका उपभोक्ताओं को ही ज्यादा नुकसान होता है और मिलावटी सामान बेचने वाले का अतिरिक्त लाभ। पहली स्थिति में खाद्य पदार्थ की मिलावट उपभोक्ता के लिए नुकसानदेह हो सकती है और मिलावटी सामान खरीदने पर वह आर्थिक नुकसान में भी रहता है यानि वह ठगा जाता है अर्थात अधिक मूल्य देकर कम गुणवत्ता की सामग्री प्राप्त करता है। दूसरी और सामान बेचने वाला अधिक लाभ कमाता है। उद्देश्य कुछ भी हो, हमें अपने पैसे का पूर्ण मूल्य मिलना चाहिए। रसायन विज्ञान की सहायता से खाद्य पदार्थ मिलावट की जांच आसानी से कर सकते हैं। हमारे स्कूल की रसायन प्रयोगशालाओं में अक्सर वे सभी रसायन उपलब्ध होते हैं जिनकी हमें विभिन्न परिक्षणों में आवश्यकता पड़ती है।

अन्तरराष्ट्रीय रसायन विज्ञान वर्ष के उपलक्ष्य में जैसा कि हमारे जनवरी के अंक में सुझाया गया था, कि सभी विपनेट क्लब, खाद्य पदार्थों में मिलावट की जांच पर 2 माह का एक 'जन चेतना कार्यक्रम' का आयोजन करेंगे। इस 'जन-चेतना कार्यक्रम' का आयोजन मुख्यतः रसायन विज्ञान की सहायता से खाद्य पदार्थों में मिलावट की जांच करना, उनसे उत्पन्न खतरों से लोगों को अवगत कराना तथा अपने स्कूल, घर के आस-पास खाद्य पदार्थों की शुद्धता पर एक रिपोर्ट तैयार करना है।

खाद्य सामग्री जैसे अनाज, दालें, व मसाले के अलावा, सब्जियों व फलों को भी अधिक समय तक ताजा रखने के लिए विभिन्न रसायनों का उपयोग किया जाता है। सब्जियों व फलों को अधिक हरा-भरा व रंगदार दिखाने के लिए उन पर अलग से रंग लगा दिए जाते हैं जो स्वास्थ्य के लिए खतरनाक साबित हो सकते हैं। इसलिए फलों व सब्जियों को अच्छी तरह से धोने के बाद ही प्रयोग करना चाहिए।

इस लेख में हम रोजमर्रा के उपयोग में आने वाली सामग्री उसमें मिलावट, उनके परीक्षण सिद्धांत जैसी जानकारी दे रहे हैं। हमें आशा है कि ये जानकारी हमारे विपनेट क्लबों के लिये उपयोगी सिद्ध होगी, विशेषकर उन क्लबों के लिए जो अन्तरराष्ट्रीय कैम्प के लिए परियोजना तैयार कर रहे हैं।

इन सूचनाओं को राष्ट्रीय विज्ञान एवं प्रौद्योगिकी संचार परिषद द्वारा सहयोग प्राप्त अनेक संस्थाओं द्वारा खाद्य पदार्थों में मिलावट की जांच संबंधी कार्यशालाओं के दौरान विकसित किया गया है। उन कार्यशालाओं में विभिन्न संसाधन सामग्री का उपयोग करते हुए विभिन्न प्रकार के खाद्य पदार्थों में मिलावट की जांच करने संबंधी प्रशिक्षण भी दिया जाता था। उन कार्यशालाओं के सार्थक अनुभव ही हम अपने क्लबों के सामने प्रस्तुत कर रहे हैं।

खाद्य पदार्थों में मिलावट की जांच करने के लिए कुछ रसायनों की आवश्यकता होती है। अधिकतर ये रसायन विद्यालय की प्रयोगशाला में मिल जाते हैं या फिर इन्हें स्थानीय बाजार से भी खरीदा जा सकता है। मिलावट की जांच के लिए आवश्यक रसायनों की सूची निम्नांकित हैं :-

1. पोटेशियम परमेंगनैट
2. म्यूरेटिक एसिड
3. आयोडिन विलयन
4. सोडियम कार्बोनेट विलयन
5. एल्कोहल
6. हाइड्रोक्लोरिक अम्ल
7. कार्बन ट्रेटाक्लोराइड
8. सोयाबीन पॉवडर
9. रेड लिटमस पेपर
10. पिनाफथेलिन विलयन
11. लिक्विड पेराफिन
12. नाइट्रिक एसिड
13. एमायल एल्कोहल
14. कार्बन डिसल्फाइड
15. सल्फर
16. एल्कोहलिक पोटॉश
17. पेट्रोलियम ईथर
18. फेरस सल्फेट
19. फेरिक क्लोराइड
20. मेन्टेनिल यलो पेपर स्ट्रीप
21. डाइस्टिस
22. यलो पेपर स्ट्रीप
23. अमोनिया विलयन
24. चीनी

खाद्य पदार्थ	मिलावट	परीक्षण	निष्कर्ष	सिद्धांत	नुकसान
नमक	चाक पाउडर अथवा सफेद पत्थर का पाउडर	थोड़ी सी नमूने की मात्रा पानी में मिलाएं	सफेद रंग होने वाला विलयन चाक पाउडर एवं अन्य अशुद्धियों को दिखाता है, जो नीचे बैठ जाती है।	चाक पाउडर में कैल्शियम एवं मैग्निशयम के कार्बोनेट होते हैं। जो पानी में घुलनशील होते हैं तथा विलयन सफेद हो जाता है।	पेट के रोग।
सरसों के दाने	आर्जिमॉन बीज	आवर्धक लेंस की सहायता से देखें।	सरसों के दानों की सतह चिकनी होती है, जबकि आर्जिमॉन के दाने खुरदरे एवं अधिक काले होते हैं।		ड्रापसी।
सुपारी	रंग एवं सैकरीन	नमूने में पानी मिलाओ	रंग पानी में घुल जाता है। सैकरीन लक्षणात्मक मीठा स्वाद देती है।		

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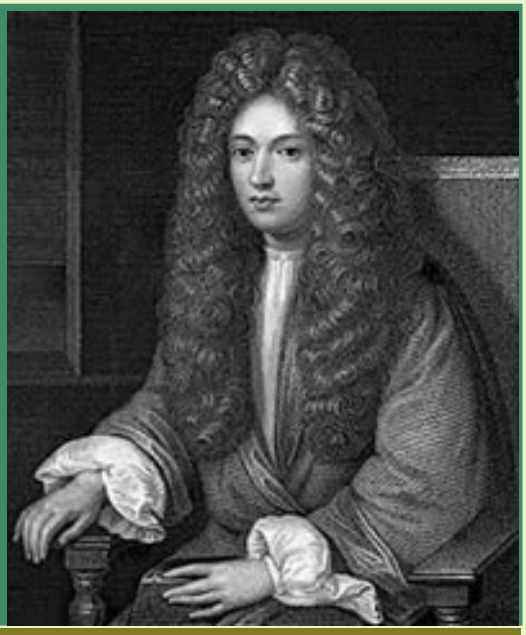
खाद्य पदार्थ	मिलावट	परीक्षण	निष्कर्ष	सिद्धांत	नुकसान
हल्दी	रंग (डाई)	हल्दी का नमूना टेस्ट ट्यूब में ले कर व 4 बूँदें स्प्रिट (रैक्टीफाइड) डाल कर हिलायें।	यदि विलयन पीला हो जाता है तो मिलावट दर्शाता है।	एनीलीन-डाई रेक्टीफाइड स्प्रिट क्रिया कर अलग हो जाती है।	केन्सर।
हल्दी/गुड़	मैटेनिलपीला	थोड़ा सा नमूना टेस्ट ट्यूब में ले तथा 5 बूँद HCl व 5 बूँद पानी डाले।	मेजेन्टा लाल रंग मिलावट दर्शाता है।	मेटेनिल (पीला), पानी में घुलनशील अम्लीय क्षारीय डाई है। जो कि HCl से क्रिया कर ph बदलने पर मेजेन्टा रंग देता है।	अधिक केन्सर देने वाला।
लाल मिर्च	ईंट का चूरा	टेस्ट ट्यूब में नमूना डाल कर पानी मिला कर हिलाये। पानी-मिर्च व HCl का पेस्ट बनाकर आग पर रखने परै।	ईंट का चूरा टेस्ट ट्यूब में तली में जाता है, लाल रंग की लौ देते हैं।	ईंट का चूरा भारी होने के कारण तली में बैठ जाता है। कैल्शियम लवण ईंट में होते हैं। जो कि HCl से क्रिया कर आग में लाल रंग की लौ देते हैं।	पेट के रोग।
हींग	रेसिन (गालबेनम) दर्शाता है। या कोलोफानी रेसिन	हींग का चूरा एक टेस्ट ट्यूब में डालकर व रैक्टीफाइड स्प्रिट के साथ विलयन बनाये तथा फिल्टर कर 10 बूँद $FeCl_3$ मिलाये।	हरा रंग रेसिन की मिलावट दर्शाता है।	कोलोफोनी एक ऐसा रेसिन है जो कि टरपनटाइन तेल के आसवन से प्राप्त होता है। यह जब रैक्टीफाइड स्प्रिट व $FeCl_3$ से क्रिया करता है रंगीन यौगिक बनाता है।	दस्त व एलर्जी।
चाय	इस्तेमाल की हुई चाय पर रंग	सोखता कागज को गीला करके थोड़ी चाय उस पर छिड़कें।	कागज के रंगीन होने पर चाय में मिलावट है। जबकि सही चाय सोखता पर रंग नहीं छोड़ती है।	कोलतार डाई जो कि चाय रंगने में प्रयोग हुई है वे प्रतिबन्धित हैं।	पेट व लीवर सम्बंधी रोग।
चीनी	चॉक का चूरा	एक टेस्ट ट्यूब में पानी व चीनी लेकर हिलाएं।	चॉक पाउडर पानी में नहीं घुलेगा।	चीनी $C_{12}H_{22}O_{11}$ पानी में घुलनशील हैं। जबकि चॉक कैल्शियम व मैगनिशियम कार्बोनेट पानी में नहीं घुलते हैं।	लीवर सम्बंधी रोग।
बूरा चीनी	वाशिंग सोडा	थोडी सी बूरा में पानी डालकर इसमें लाल लिटमस डुबो कर देखें।	लाल लिटमस नीला हो जायेगा तो वाशिंग सोडा की मिलावट है।	वाशिंग सोडा सोडियम कार्बोनेट है जो कि क्षार है तभी लाल लिटमस नीला रंग देता है।	डायरिया।
बूरा चीनी/गुड़	वाशिंग सोडा	टेस्ट ट्यूब में थोड़ा बूरा डाल कर कुछ बूंदे हाइड्रोक्लोरिक अम्ल (HCl) की डालें।	यदि बुलबुले उठते हैं तो मिलावट है।	जब सोडियम कार्बोनेट हाइड्रोक्लोरिक अम्ल से क्रिया करता है तो कार्बनडाई आक्साइड गैस निकलती है।	दस्त, डायरिया व उल्टी।
शुद्ध घी/मक्खन, दूध-दही, पनीर, खोया, मिठाई, चीज	वनस्पति घी	एक टेस्ट ट्यूब में पिघला घी या मक्खन लेकर बराबर मात्रा में HCl डाल दे तथा थोड़ी सी चीन डालकर अच्छी तरह से हिलाएं। व 5 मिनट रख कर छोड़ दें।ें।	लाल रंग आने पर वनस्पति घी की मिलावट है।	वनस्पति घी में सीसेम तेल होता है। फिनोलिक तत्व सीसेमोल फ्रुक्टोज से क्रिया करके जो कि चीनी के द्रंवण से बना है HCL से क्रिया कर लाल रंग देता है।	पेट दर्द व लीवर।
	कुचला आलू व स्टार्च	एक टेस्ट ट्यूब में पिघला घी लेकर कुछ बूँद आयोडीन की डाल दें।	नीला रंग घी में स्टार्च की मिलावट दर्शाता है।	स्टार्च के एमाईलोस फ्रेक्सन से आयोडीन क्रिया कर नीले रंग का योगिक देता है।	पेट के रोग।

खाद्य पदार्थ	मिलावट	परीक्षण	निष्कर्ष	सिद्धांत	नुकसान
अरहर दाल	खेसरी दाल व रंग	दाल को लेंस से देखने पर।	खेसरी दाल, छोटी वलयदार किनारों वाली जबकि अरहर चिकनी व गोल आकार की होती है।		अधरंग या फालिस न्यूरों टोक्सिक व घुटने का दर्द।
अरहर दाल/बेसन	खेसरी दाल व रंग	नमूने में HCl की 7 बूँद डाल कर 15 मिनट रखें।	पीला लाल रंग खेसरी दाल या खतरनाक रंग की मिलावट दर्शाता है।	खेसरी दाल एक लेथीरियस सेटीरस है जो कि बीटा-आक्साइल अमीनों एलेएनाइन (BOAA) एक घातक अमीनो एसिड है। HCl से क्रिया कर पीला रंग अलग हो जाता है।	ये रंग केन्सर कारक होते हैं।
हरे मटर व दाल	हरा रंग	नमूने को पानी में डाल कर आधे घंटे के लिए छोड़ दो व हिला ले।	पानी रंगीन होने पर मिलावट है।	मैलेचाइट ग्रीन एक एनीलीन डाई है जो कि पानी में रंग हरा देती है।	पेटदर्द अल्सर, लीवर ट्यूमर व कैन्सर।
खाद्य तेल	आरजीमोन तेल	एक टेस्ट ट्यूब में तेल का नमूना लेकर उतना ही HNO_3 डाल दे व 5 मिनट छोड़ दें।	लाल रंग का द्रव्य प्राप्त होने पर मिलावट है।	ये लाल रंग HNO_3 से क्रिया करके बनता है।	डायरिया, जी मिचलाना उल्टी व ड्राप्सी।
		नमूने में 5 बूँद $FeCl_3$ विलयन की व 5 बूँदे HCl की डाल कर लेन्स से देखें।	नुकीले भूरे क्रिस्टल होने पर आरजीमोन की मिलावट है।	आरजीमोन तेल में सनग्यूएरीन व डाई-हाइड्रोसनग्यूरीन एल्केलोइड जोकि टोक्सिक है। ये $FeCl_3$ व HCl से क्रिया कर भूरा रंग देते हैं।	ड्राप्सी, पेट गैस, बुखार पैरों पर सूजन, ग्लूकोमा, व श्वास शोथ।
	मिनरल तेल	नमूने में 10 बूँद एल्कोहलिक पोटाश लेकर 5 मिनट तक गर्म करें।	यदि विलयन गंदला हो तो मिनरल तेल की मिलावट दर्शाता है।	एल्कोहलिक पोटाश KOH तेलीय ईस्टरों का साबुनीकरण करता है लेकिन मिनरल तेल जो कि पेट्रोलियम से बनता है यह क्षारीय KOH के साबुनीकरण क्रिया नहीं देता है इसलिए पानी डालने पर गंदलापन देती है।	लीवर व केन्सर के दुष्प्रभाव।
	कास्टर आयल	नमूने में पेट्रोलियम (ईथर) डाल कर ठन्डा करने पर।	सफेद गंदलापन कास्टर आयल दर्शाती है।	ट्राईग्लीसराइड जो कि कास्टर तेल का हिस्सा है पेट्रोलियम ईथर से क्रिया कर गंदला होता है।	पेट के रोग।
शहद	चीनी व पानी	रुई का टुकड़ा नमूने में भिगोकर जलाये।	यदि नहीं जले या आवाज करके जले तो मिलावट है।	पानी होने के कारण नहीं जलता है या आवाज करके जलता है।	
	इन्वर्ट चीनी	नमूने में एक चुटकी रिसोरसिनोल व 5 बूँद HCl डालने पर।	लाल रंग प्राप्त होता है।	शहद में मिलावट होने पर रिसोर-सिनाल व HCl के साथ लाल रंग देता है।	
मिठाई जैम व जूस	पीला मेटेनिल रंग	नमूने का पानी में घोल बनाकर 5 बूँद HCl डालने पर	गुलाबी रंग आता है	HCl डालने पर पीला मैटेनिल कम PH पर गुलाबी रंग देता है।	केन्सर।
गेंहू व खाद्य दाने	एरगोट (एक फंफूदी जो कि जहरीली होती है।	नमूने को नमक के पानी में डाले।	एरगोट विलयन के ऊपर तैरता है, जबकि खाद्य दाने नीचे बैठ जाते हैं।		जहरीला।
काली मिर्च	पपीते के बीज	टेस्ट ट्यूब में पानी व साबुत काली मिर्च डालने पर।	काली मिर्च नीचे बैठ जाती है व पपीते के बीज तैरते रहते हैं।		पेट के रोग व लीवर।

खाद्य पदार्थ	मिलावट	परीक्षण	निष्कर्ष	सिद्धांत	नुकसान
लौंग	तेल रहित लौंग	लेंस से देखें	तेल रहित लौंग छोटी होगी व उस पर सिकुड़ने के निशान होंगे।		
कॉफी	चकोरी चूरा	टेस्ट ट्यूब में पानी व नमूना डालकर हिलाये व 5 बूँद HCl तथा दो दाने रिसारेलि नोल डालने पर	कॉफी पाउडर तैरता है जबकि चकोरी पाउडर लाल रंग देता है।	चिकोरी जड़, इनूलिन की उपस्थिति में ठन्डे पानी में घुल जाती है। इनुलिन पानी से क्रियाकर फ्रेकटोज देता है जोकि HCl व रिसोरसिनोल से क्रियाकर लाल रंग का योगिक देता है जोकि हाइड्रो-क्लोसिल मिथाईल फरफ्यूरल है।	जोड़ों का दर्द, पेट के रोग।
	चीया या इमली के बीज	फिल्टर पेपर पर नमूना डालकर सोडियम कार्बोनेट का विलयन उस पर डाले।	रंग का अलग होना मिलावट दर्शाता है।	ये रंग कोल तार डाई है जो कि प्रतिबन्धित है। यह फिल्टर पेपर पर रंग देती है।	डायरिया।
लाल मिर्च	रोहडमिन-बी रंग	थोड़ी सी रुई को तरल पेपराफिन में भिगोकर मिर्च पर रखें।	रुई के लाल होने पर मिलावट है।		
खाद्य तेल	साइनाइड	टेस्ट ट्यूब में थोड़ा नमूना लेकर 10 बूँद पोटाश (अल्कोहलिक) मिलाकर गर्म करें इसमें 5 बूँद $FeCl_3$ व 5 बूँद $FeSO_4$ मिला कर अच्छी तरह से हिलायें।	नीला रंग मिलावट दर्शाता है।	यह हाइड्रोसाइनिक अम्ल है जोकि नीला रंग देता है और साइनाइड की उपस्थिति दर्शाता है।	केन्सर।
सोडा लेमन	मिनरल एसिड	नमूना टेस्ट ट्यूब में लेकर 5 बूँद HCl की डाले फिर इस विलयन में पीले रंग की पट्टी डुबाकर देखें।	बैंगनी रंग आना मिलावट का संकेत है।		
चाय	चमड़े के टुकड़े	कागज की गेंद बनाकर उसमें आग लगा दें तथा चुटकी भर चाय उस पर डाले।	चमड़ा जलने की गंध मिलावट दर्शाती है।		
धनिया	मिट्टी-बुरादा	एक टेस्ट ट्यूब में पानी लेकर चुटकी भर धनिया डालने पर।	बुरादा पानी में ऊपर तैरता है व धनिया तली में बैठ जाता है	लकड़ी का घनत्व धनिये से कम होता है इसलिए वह तैरता है।	
दूध	चीनी	थोडा सा नमूना लेकर 5 बूँद HCl डाले थोडा रिसोर सिनाल।	लाल रंग चीनी की उपस्थिति दर्शाता है।	फ्रैक्टोस बनने के कारण लाल रंग आता है।	
दूध	बोरिक अम्ल	थोड़ा सा नमूना टेस्ट ट्यूब में डालकर 20 बूँद HCl डालें। अच्छी तरह हिलाकर पीली कागज़ की स्ट्रिप डुबाकर निकाले।	कागज की पट्टी के पीले से लाल रंग का बदलना बोरिक अम्ल दर्शाता है।		पेट के रोग।
दूध	यूरिया	ट्यूब मेंदूध लेकर यरियेज एन्जाइम डाल कर हिलाये, 5 बूँद पोटेशियम कार्बोनेट डाल दे, ट्यूब के मुख पर कार्क (फिल्टर पट्टी सहित ढक दे)	यदि फिल्टर पेपर का रंग पहले लाल फिर हरा हो जाये यूरिया की मिलावट है।		अल्सर व लीवर सम्बंधित रोग।

"He (Boyle) was, surprisingly, an alchemist, but his alchemy was a logical outcome of his atomism. If every substance is merely a rearrangement of the same basic elements, transmutations should be possible. Modern atomic physics has proved him right."
Chambers Biographical Dictionary, Centenary Edition. Chambers Harrap Publishers Ltd., 1997.

"With the publication of The Sceptical Chymist (1661), Boyle prepared the way for a more modern view of chemistry, which put aside alchemical ideas and Aristotelian doctrine of four colours...it was Boyle who changed chemical attitudes and prepared the way for Priestley and Lavoisier to create the Chemical Revolution."
The Cambridge Dictionary of Scientists. Cambridge University Press, (Second Edition, 2002.



Robert Boyle
Who Paved the Way for Modern Chemistry

"Boyle's main contribution to chemistry was his insistence on experiment, precision and accurate observation. He devised many analytical tests including the use of vegetable dyes as acid-base indicators and of flame tests to detect metal. The chemist's concern for the purity of his material began with Boyle.
A Dictionary of Scientists. Oxford University Press, 1999.

Robert Boyle established the study of chemistry as a separate science. In fact among many rightful ontenders for the title "Father of Modern Chemistry" is Robert Boyle. He was the first prominent scientist to perform experiments under controlled conditions and publish his researches with elaborate details concerning procedure, apparatus and observations. His best known scientific publication was The Sceptical Chymist. In this work, which was published in 1661, Boyle discusses the idea of an element. While it is true that Boyle's idea of an element was somewhat vague but his idea was a clear break with the then erroneously held concept of an element. The first use of the term "chemical analysis" is attributed to Boyle. He used this term in the same sense as we understand it today. He did important work in mechanics, medicine, hydrodynamics and a wide variety of experiments with vacuum pump. Boyle's most interesting and influential contribution was his "corpuscular or mechanical hypothesis." This was the fullest and most detailed development of physical atomism up to his time. He was also interested both theoretically and practically in alchemy. His interest in alchemy was governed by his desire to acquire more knowledge of God and the world than by any desire for riches. Boyle was active in the "Invisible College", an informal body devoted to the "new philosophy", which in 1663 became the Royal Society. Unfortunately while Boyle's contribution was very significant in the development of modern chemical thought but today he is remembered solely for Boyle's Law. Boyle was one of the leading intellectual figures of the seventeenth century. Boyle was a prolific writer. He was a great experimentalist. His scientific interest covered a broad area. Throughout his life Boyle sought to improve the lot of humanity by devising better methods and practices. For example he was interested in the improvement of agricultural methods, in the improvement of medicines and medicinal practice, in the possibility of preserving food by vacuum packing and in many other things. He was involved in a project to distill salt water into fresh at sea. Probably Boyle organized a commercial enterprise that produced chemicals.

He had an abiding faith in his religion, Christianity. He spent time and energy for making the Bible available widely. He got it translated into a variety of languages such as Irish, Turkish, and various native American languages. Boyle had no hesitation in believing, though in

Boyle defined the term "element" in Sceptical Chymist (1661): "…certain primitive and simple, or perfectly unmingled bodies; which not being made of any other bodies, or of one another, are the ingredients of which all those called perfectly mixt bodies are immediately compounded, and into which they are ultimately resolved." Many ideas in the Skeptical Chymist were taken over from Rene Descartes (1596-1650). However, in one respect Boyle fundamentally disagreed with Descartes. For Descartes, the concept of vacuum did not exist. He believed in an all pervading either. However, Boyle rejected the idea of ether as he did not get any experimental evidence for it. Like Descartes, Boyle ones believed that the primary particles move freely in fluids and less freely in solids.

a more intellectual realm, that God does help some men acquiring scientific knowledge.

Boyle sincerely believed in miracles. In fact miracles were a crucial factor in his opting for Christianity. He saw clear stamp of God upon the Christian miracles.

Robert Boyle was born at Lismore Castle, Munster, Ireland on January 25, 1627. He was the fourteenth child of his parents' fifteen children. And being the last child of his parents to survive to adulthood, he was the youngest in the family. His father, Richard Boyle (1566-1643) was the first Earl of Cork. Richard Boyle was immensely wealthy and he is also known as the "Great Earl". Richard Boyle had left England at the age of 22 and had gone to Ireland. Boyle's mother Catherine Fenton, was Richard Boyle's second wife, his first having died within a year of the birth of their first child. Boyle hardly got time to know his parents well. His mother died in childbirth a few weeks after his third birthday. Boyle last saw his father just before he left for a continental tour. At the time Boyle was twelve. In his autobiographical account he reflects on his noble birth that 'being born heir to a great family is but a glittering kind of slavery' and 'is ever an impediment to the knowledge of many retired truths, that cannot be attained without familiarity with meaner persons.'

Boyle had a privileged upbringing. Boyle's parents believed that best upbringing for young children up to the time they began their education could be provided away from their parents. So Boyle was sent away to be brought up in the country. Boyle had no university degree. Boyle was educated at home and then he studied at Eton for four years (1635-38). Boyle alongwith one of his brothers entered Eton in 1635. The two young Boyles lived in the house of the Headmaster John Harrison. When Boyle entered Eton, it was just becoming fashionable as a place where important people were sending their children for studying. Boyle writes that Harrison gave Boyle "a strong passion to acquire knowledge". Boyle was doing very well at Eton. However, after the retirement of Harrison, Boyle failed to fit in with the educational discipline, Harrison's successor brought to the school. And finally Boyle and his brother were taken out of Eton in November 1638. After leaving Eton, Boyle came under the tutorship of Isaac Marcombes, a native of Auvergue. Boyle was sent on a Grand Tour of France and Italy (1638-44), accompanied by his brother Francis and Marcombes. In Italy he studied the work of the recently deceased Galileo. During his stay abroad, Boyle's father got entagled in battle with Irish rebels and he died in September 1643. Boyle spent some time at Geneva and he lived there mainly on his tutor's earning. In the summer of 1644 he had to sell some of his jewellery to finance his trip to England. When Boyle returned to England, it was in a chaotic state. Since 1642, King Charles was at war with the Parliament and several battles in 1644 left both King and Parliament in disarray.

It took quite some time before he could start living at

Some important works of Robert Boyle

1. New Experiments Physico-Mechanical, Touching the Spring of Air and its Effects
2. Certain Physiological Essays
3. The Sceptical Chymist
4. Some Considerations Touching the Usefulness of Experimental Natural Phylosophy
5. The Origins of Forms and Qualities
6. The Excellency of Theology, Compar'd with Natural Philosophy
7. Considerations about The Excellency and Grounds of the Mechanical Hypothesis
8. The Free Enquiry into the Vulgarly Receiv'd Notion of Nature
9. The Discourse of Things above Reason
10. Disquisition about the Final Causes of Natural Things
11. The Christian Virtuoso
12. Experimental History of Mineral Waters (1685)
13. Of the Reconcileableness of Specific Medicines to the Corpuscular Philosophy (1685)
14. Medicinal Experiments: or a, Collection of Choice Remedies, 1692 (Posthumous)
15. Experiments and Consideration Touching Colours
16. Hydrostatic Paradoxes
17. About the Excellency and Grounds of the Mechanical Philosophy.

Boyle did not accept various honours offered to him by Charles II such as Provotship of Eton and a peerage. However, he was appointed to the Board of the East India Company and Member in the Royal Company of Mines. It has been reported that Boyle carried out explorations for the Royal Company of Mines for industrial and medical resources. He was granted a forfeited estate in Ireland in 1662. The income form this estate was used by Boyle for the advancement of learning and the dissemination of Christianity. He was appointed Governor of the Society for the Propagation of the Gospel in New England in 1661.This position he held until 1689. Robert Boyle died in London on December 30, 1691. He was buried in the Church of Saint-Martin-inthe- Fields next to his sister. However, the church was later demolished and no record was kept as to where his remains were moved.

Stalbridge. During this time he lived with his sister Katherine and he also undertook a trip to France to repay his debts to his tutor. Finally he settled down at Stalbridge. Though Boyle had no intention to live long at Stalbridge, he remained there for around six years. At the beginning Boyle engaged himself in devotional writing. He composed early versions of Seraphic Love, The martyrdom of Theodora, and other pious reveries. Subsequently Boyle came in contact with several members of the loosely organized group of technical and utopian writers inspired by Francis Bacon and clustering around Samuel Hartlib.

About 1649, Boyle became interested in scientific experimentation. Boyle's first exposure to systematic experimentation occurred at the hands of George Starkey who wrote immensely popular Chrysopoetic treatises under the pseudonym Eirenaues Philalethes. From Starkey, Boyle acquired a full experimental knowledge of Helmontian chymistrty, a discipline that fused mundane chemical pursuits with the quest for such 'great arcana' as the universal dissolvent or alkhasa and the Philosopher's Stone. For this he needed a furnace. However, he could not find one at Stalbridge, a place far enough away from tradespeople who could make such an item. So he ordered one but when it finally arrived, it was completely broken. Eventually a furnace did arrive and Boyle could start his experimenting.

Gottfried Wilhelm Leibniz (1646-1716) expressed his astonishment to Christian Huygens (1629-95) over the fact that Boyle did not construct any theory based on his excellent and extensive experimental observations. He wrote that Boyle "who has so many fine experiments, (had) not come to some theory of chemistry after meditating so long on them. Yet in his books, and for all the consequences that he draws from his observations, he concludes only what we all know, that everything happens mechanically. He is perhaps too reserved. Excellent men should leave us even their conjectures; they are wrong if they wish to give only those truths that are certain."

Boyle moved to Oxford in 1654. Here he came into contact with a group of physicians and natural philosophers who encouraged his pursuit of natural philosophy. Among those with whom Boyle interacted were: John Wilkins, John Wallis, Seth Ward and Christopher Wren. At Oxford, Boyle first worked on pneumatics. He got an air pump built for him by Robert Hooke after the type invented by Otto von Guerick (1602-86) in 1654. Assisted by Robert Hooke, Boyle performed a number of pioneering experiments. He showed that air was essential for the transmission of sound, and for the respiration and combustion. He also realized that respiration and combustion exhausted only part of the air. He showed for the first time that Galileo was correct in his assertion that all objects fall at the same velocity in a vacuum. In his most famous experiment on pneumatics, he took a U-shaped tube with a shorter closed end, and a longer open end in which he poured mercury. With the help of this device he could isolate a given volume of gas in the shorter end. When the mercury was level in both 'limbs', the gas was under atmospheric pressure. Boyle could increase the pressure by adding more mercury to the longer limb of the Ushaped tube. And by doing so, Boyle found that the volume was halved if the pressure was doubled, reduced to a third if the pressure was tripled and so on. His work on compressibility of air was published in 1660. It was his first major scientific work. It was titled New Experiments Physico- Mechanicall, Touching the Spring of the Air and its Effects. In the second edition of this work published in 1662, Boyle described the famous law stating that pressure and volume of a gas are inversely proportional that is if the pressure increases, volume would decrease and the vice versa. It became known as Boyle's Law in Britain and USA but in France it was credited to Edme Mariotte (1620-84), who announced the discovery of the same law that Boyle had announced in 1662. As we know Boyle's law holds for ideal gas and it can be summarized as PV=k, where k is a constant , and P and V are pressure and volume respectively.

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भरिए, मोड़िए, लिफाफे में डालिए और भेजिए-डाक टिकट लगाने की आव यकता नहीं

'विपनेट न्यूज' इसके सदस्यों को निःश ुल्क भेजी जाती है। यह लगभग 12,500 सदस्यो तथा लगभग 1400 विज्ञान संचारकों को भेजी जा रही है। हम 'विपनेट न्यूज' की सदस्य सूची की समीक्षा तथा विषयवस्तु में सुधार कर रहे हैं। अतएव हमारा आपसे आग्रह है कि कुछ मिनटों का समय निकालकर इस प्र श्नावली को भरें और इसे हमें भेज दें।

कृपया ध्यान दें कि यदि आपने हमें जवाब नहीं दिया तो 'विपनेट न्यूज' का प्रेषण हमारे द्वारा रोका जा सकता है। अतः कृपया यह सुनिश्चित करें कि आपका जवाब हमें 31 जुलाई, 2011 से पहले मिल जाए।
आपके सुझाव बहुमूल्य हैं। कृपया 'विपनेट न्यूज' के हाल के अंकों के संबंध में अपनी राय हमें दें ताकि हम पत्रिका की गुणवत्ता में सुधार कर सकें।

आप अपनी टिप्पणियां ऑनलाईन भी भेज सकते हैं (ऑनलाइन भेजने के लिए पता है www.vigyanprasar.gov.in%A

व्यक्तियों के लिए

1. नाम ..... आयु ..... लिंगः पुरूष/महिला .....
2. पता .....
   ..... पिन.....
3. ई-मेल .....
4. उच्चतम शैक्षिक योग्यता .....
5. व्यवसाय.....
6. सदस्यता संख्या (पत्रिका के लिफाफे पर अंकित है)

संस्थान के लिए- (विपनेट क्लब यदि है तो उसका क्रमांक).....

1. संस्थान का नाम.....
2. पता.....
   .....पिन ....
3. ई-मेल .....
4. वर्तमान निदेशक प्रमुख का नाम .....
5. सदस्यता संख्या (पत्रिका के लिफाफे पर अंकित है)

(अनुरोध है कि संस्थान के निदेशक या लाइब्रेरियन यह सूचना भिजवा दें।)

कृपया उत्तर के लिए बॉक्स में (√) का निशान लगाएंः

1. आपको विपनेट न्यूज कब से मिल रही है?
   ❑ एक वर्ष ❑ दो वर्ष ❑ तीन वर्ष या अधिक

2. विपनेट न्यूज में प्रकाशित आलेखों के स्तर के बारे में आप क्या सोचते हैं?
   ❑ हाई स्कूल के विद्यार्थी ❑ आम आदमी
   ❑ विज्ञान की पृष्ठभूमि वाले पाठक ❑ विशेषज्ञ

3. विपनेट न्यूज के कौन से स्तंभ/फीचर आपको सर्वाधिक पसंद हैं? (कृपया वरीयता क्रम में श्रेणीबद्ध करें)
   - ❑ पर्यावरण
   - ❑ समकालीन मुद्दों पर आलेख
   - ❑ इन्ट्रेक्टिव कॉलम
   - ❑ विशेष विषयों पर लेख
   - ❑ विज्ञान समाचार
   - ❑ क्लबों की रिपोर्ट
   - ❑ संपादकीय

4. विपनेट न्यूज में आप कौन सा नया स्तंभ/फीचर देखना/पढ़ना चाहेंगे? (कृपया वरीयता क्रम में श्रेणीबद्ध करें)
   - ❑ क्विज और प्रतियोगिता
   - ❑ विद्यार्थियों के लिए परियोजनाएं
   - ❑ ज्योतिष, वास्तु, फेंगशुई
   - ❑ विज्ञान पुस्तकों, फिल्मों और सीडी रोम की समीक्षा
   - ❑ संसाधन एवं संदर्भ
   - ❑ अन्य कोई गतिविधि जो आप पंसद करते हैं।

5. आपको मिली विपनेट न्यूज की प्रति कितने लोग पढ़ते हैं?
   - ❑ एक ❑ दो ❑ तीन
   - ❑ चार ❑ पांच ❑ पांच से अधिक

6. विपनेट न्यूज की विषयवस्तु का आप कैसे उपयोग करते हैं? विशिष्ट उदाहरण दें।

7. विपनेट न्यूज के अलावा आप कौन सी अन्य पत्रिकाएं पढ़ते हैं?

पत्रिका का नाम	भाषा	एक वर्ष में अंकों की संख्या	वार्षिक सदस्यता
i)			
ii).....			

8. क्या आप विपनेट न्यूज के पुराने अंकों को भावी संदर्भ हेतु संभालकर रखते हैं?
   - ❑ हां
   - ❑ नहीं

9. हम अब तक आपको विपनेट न्यूज की प्रतियां मानार्थ भेजते रहे हैं। यदि हम इसकी वार्षिक सदस्यता की राशि नियत करें तो भी क्या आप पत्रिका पढ़ना चाहेंगे?
   - ❑ ₹ 300
   - ❑ ₹ 200
   - ❑ ₹ 100

10. यदि हम हिंदी और अंग्रेजी संस्करणों को पृथक कर दें तो आप कौन सा संस्करण प्राप्त करना चाहेंगे?
    - ❑ हिंदी
    - ❑ अंग्रेजी

11. हम विपनेट न्यूज का ईमेल संस्करण भी भेज रहे हैं। यदि आप केवल ईमेल संस्करण प्राप्त करना चाहते हैं तो अपना ईमेल आईडी लिखें.....

12. आप विपनेट न्यूज को 1 (खराब) से 10 (उत्कृष्ट) के पैमाने पर क्या रेटिंग देना चाहेंगे?
    .....

13. विपनेट न्यूज को हम और अधिक पठनीय तथा आकर्षक कैसे बना सकते हैं, इस संबंध में आप अपने सुझाव दें।
    .....
    .....

(आवश्यक हो तो अतिरिक्त पृष्ठ का उपयोग करें)

दिनांक .....

हस्ताक्षरः .....

नाम : .....

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   .....
   .....
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    .....

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    .....
    .....
    .....

(Use separate sheet if necessary)

Date: ..... **Signature .....**

Name:.....

Godmen Also Use knowledge of Chemistry to Perform So-called Miracles

Never before in the history of human civilization, science and technology was so advanced as it is today. There is no aspect of our life now which has remained untouched by modern Science and Technology. But there are people, not only in India but across the world, those still hold very strong belief system which has no scientific basis. This belief system and their prejudices are so strong that they are aversed to any scientific scrutiny or rational interpretation of the same. Such people become soft targets for some people who claim themeself to be Godmen or reincarnations or the avatar of God. These Godmen claim to possess some supernatural power to perform some miracles like producing something out of nothing or converting one thing into another (!). Before proceeding further, let's try to understand the meaning of three words, i.e.. Miracle, Magic and Mystery or 3 M, as our science communicators address them. They have somthing in common but have diffrent psychological cannotation. We will try to understand the meaning of each M with its psychological connotation it has on other person when it is used in common parlance .

Miracle(M1):- A miracle is a phenomenon which seems to be unexplained by known natural laws and considered to be supernatural in origin or beyond the understanding of human mind. Here, again the question is, what is supernatural. It is considered to be something outside the natural world, especially not attributable to forces of nature. If we believe that a phenomenon is miracle, then no effort will be made to find its scientific explanation or to analyze the phenomenon logically on the basis of existing known law of nature.

Mystery (M2):- Mystery is a natural phenomenon which is not yet explained. This signifies that at present there is no probable scientific explanation to that, but efforts are on to find the same unlike in the case of miracle.

Magic (M3):- Magic is an art, where something is presented by a person to entertain the people in such a way that there is apparently no connection between cause and effect. In magic tricks, there is something which is always hidden. For example a magician is hanging an object in the air. But as per known law of gravity, it is impossible. But the magician hang the object with the help of a very thin and transparent thread, which is not visible to the audience. Once , this fact is known, then the entire thing becomes very simple to explain. Unlike God man, magician never claim that he has some supernatural power. In fact they always say that all their work is an art to entertain the people.

Today, much of the natural phenomena which people used to belive to be the miracle or supernatural in origin, can be explained with the help of our current scientific knowledge. To find the scientific explanation of such so-called miracles, to begin with, these should be tested on the premise of law of conservation of mass and energy. According to this theory, the matter or energy cannot be created or destroyed, but it can be converted from one form to other. This law is one of the most fundamental laws of nature on which modern science is based. If so then, how one can claim that he/she can produce something out of nothing. Interestingly some godman claim that they can do so with the help of their mental power (!), which is in total defiance of law of conservation of energy and mass,

A number of organizations and individual science activists are now working all over India on this subject. About more than 2000 such tricks/phenomena have been collected and complied across the country, which are generally considered to be miracles by the common people. All these tricks or phenomena can be categorized into four groups as follows:-

Sleight of Hands: It is more of an art and skill in which the movement of hand or body is utilized to create desired impact on the viewer by producing something or making something to disappear. The act is so sudden and fast that the viewer cannot co-relate the effect with cause.

Tricks based on Mechanical Apparatus: To create some desired impact, sometime specially designed mechanical apparatus are used by creating proper ambiance like enchanting mantras etc., so that the trick can be executed smartly without being noticed.

Tricks based on human anatomy, physiology and psychology: - The five senses of human being have their own limitation and they can be easily deceived. Similarly by certain exercises, mind of a subject can be pre-conditioned for a desired impact for taste, touch, sound etc.

Tricks based on chemicals: A number of tricks are performed with the help of chemicals. Like ghost appearing on a plain paper, burning of ghost, performing operation with cutting the body (!), etc. To create the desired impact, in all such tricks chemicals are used.

In our January 2011 issue of VIPNET News, as part of International Year of Chemistry 2011, we suggested some activities to be taken up in a campaign mode. One such activity was 'Scientific Explanation of Miracles' based on knowledge of Chemistry. The basic objective of this compaign would be to make people aware about such unscrupulous people those cheat innocent peoples and to develop & nurture scientific and rational thinking among them. In this issue we are giving about 23 such tricks with their explanations and the knowledge of chemistry used in them. Vigyan Prasar has also published a book entiled " Seeing Is Not Always Believing" in English and "Sach to Kuch Aur Hai" in Hindi. National

Council for Science & Technology Communications is also organizing training programmes on the subject since last 15 years. At present the Master Resource persons are available almost is all the States. Our VIPNE Club can take the help of these resource persons in organizing campaign comprising of jathas, performances, demonstrations and lectures on this subject.

1. CREATE FIRE BY MAGIC

MATERIAL REQUIRED :Dry pieces of paper, a metal

plate (20 cm diameter), potassium permanganate powder, glycerine

PREPARATION : 1.2. Arrange some pieces of paper on a metal plate.Put a piece of paper with some potassium permanganate powder in the centre.

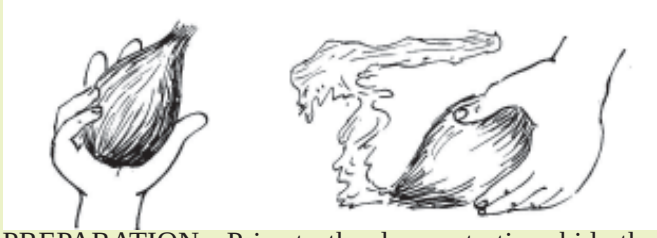
PERFORMANCE : 1.2. Acting as if you are pouring *'ghee'*, put two or three drops of glycerine, over the potassium permanganate powder.Glylcerine reacts with potassium permanganate. First smoke comes out and then the pieces of paper start buring with flame.

EXPLANATION : Sufficient heat is evolved in the reaction between potassium permanganate and glycerine. This heat burns the paper pieces.

PRECAUTIONS : 1.2.Use fine grains of potassium permanganate.Use glycerine in appropriate quantity (1-2 tea spoonfuls).

2. FUNERAL OF A GHOST

MATERIAL REQUIRED : One fresh but dry coconut, a very small piece of sodium, a matchbox, a glass of water.



PREPARATION : Prior to the demonstration, hide the sodium piece in a dry coconut inside the coir

PERFORMANCE : 1.2. Then spray a few drops of water on the coir side of coconut by chanting few *mantras.*The next very moment, as the sodium comes in contact with water it starts burning and soon the whole coconut burns as well.

EXPLANATION : It is a simple reaction of sodium and water which gives fire as a result.

PRECAUTIONS : 1.2.3.4.5.6. Take a very small piece of sodium (grain size).Keep the sodium away from children.Place the sodium in between the coir just before the demonstration.Sodium reacts with ether or spirit, so be alert while handling sodium.Use fresh but dry coconut.Sodium pieces must be preserved in kerosene when not in actual use.

3. EVIL SPIRIT BLOOD FROM COCONUT

MATERIAL REQUIRED : A nail, a green tender coconut, few granules of potassium permanganate, a bowl, wax or gum.

PREPARATION : 1.2.3. Prior to the demonstration, take a tender coconut and make a small hole in it with the help of the nail and take out the coconut water in a bowl.Dissolve granules of potassium permanganate, in the coconut water.Pour the coconut-water, carefully back in to the coconut and close the hole with wax or gum.

PERFORMANCE : 1.2. Now chant a few *mantras*, serve the coconut in front of the image of God and create a religious environment.Break the coconut, the red water

flowing out of coconut will give the impression of blood.

EXPLANATION : A simple trick using potassium permanganate.

PRECAUTIONS : The hole in the coconut should be small and plugged well. The coloured water should be gently poured into the coconut taking care not to stain the green coconut.

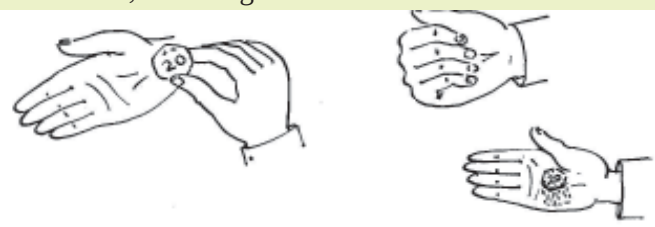
4. BHABHUTI FROM COIN

MATERIAL REQUIRED : Mercuric chloride powder or solution in water, an aluminium coin

PREPARATION : Apply mercuric chloride powder on your index finger and thumb or dip fingers in mercuric chloride solution.

PERFORMANCE : 1.2.3.4. Call a volunteer and take a ten or twenty paise coin from him.Rub your index finger and thumb on both the sides of coin and cover the coin with your hand.A grey substance looking like *bhabhuti* starts forming on the coin.After some time you can show this coin to the audience and tell them that with your spiritual power you have generated *bhabhuti.*

EXPLANATION : When mercuric chloride reacts with aluminium, heat is generated and aluminium oxide is



formed, which looks like *bhabhuti.*

PRECAUTIONS : 1.2.3. Mercuric chloride is poisonous. It should be kept safely and out of reach of children.Wash

your hands with soap after the performance.Use aluminium coins only.Mercuric chloride is a highly poisonous chemical and can never be advised to be used in such show.

5. HAND PRINTS OF GODDESS

MATERIAL REQUIRED : White cloth, turmeric powder, slaked lime and a glass of water.

PREPARATION : 1.2. White cloth is dyed yellow by dipping it in turmeric powder solution and dried.Slaked lime solution is substituted for water in a glass.

PERFORMANCE : 1.2.3.4.The performer selects a person from the audience telling him that he is possessed by Goddess.He is asked to wash his hands with the water provided (lime water).Ask him to put his hands on the yellow cloth.Red coloured impressions of hands appear on the cloth. Tell the audience that this is the hand print of the Goddess.

EXPLANATION : Here turmeric powder is an acid base indicator and slaked lime $Ca(OH)_2$ is a base. The red hand prints appear due to reaction of turmeric powder and slaked lime solution.

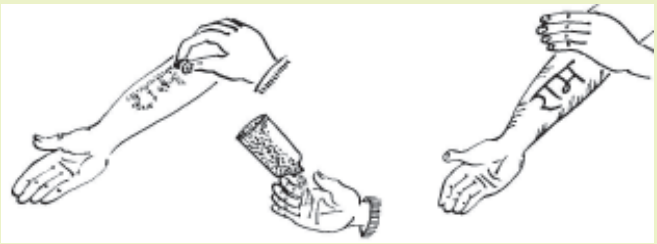
PRECAUTIONS : 1.2. Use only diluted solution of slaked lime.Make the volunteer wash his hands after the performance.

6. TATTOOING NAME ON YOUR BODY

MATERIAL REQUIRED : Ferric chloride solution and sodium ferrocyanide

PREPARATION : 1.2. Before performing the show write the desired name on your hand or body using ferric chloride. Let it dry. The name will not be visible on the skin.

PERFORMANCE : 1.2.3.4. Now perform the show.



Assure the audience that nothing is written on your hand or body.Now apply the colourless solution of potassium ferrocycyanide on a piece of cloth and rub it with palm or fingers.Rub your fingers at the place where the name or message had been written.The pre-written message will appear on hand in green colour. You can claim that this message has been written by a supernatural power.

EXPLANATION : The words or message written in ferric chloride solution are not visible due to its colour, but as soon as it reacts with potassium ferrocyanide, the words appear in blue colour.

PRECAUTIONS : Sodium ferrocyanide is poisonous, so hands or body should be washed after the performance.

7. CHANGE THE COLOUR OF TURMERIC

MATERIAL REQUIRED : Turmeric powder, slaked lime powder.

PREPARATION : 1.2.3.4.5. Apply slaked lime on index finger.Put turmeric powder on your other palm and show to the devotees or volunteers.Chant the mantras and put your index finger on turmeric powder and mix.The turmeric powder would turn red.Show to the devotees and they will be surprised.

EXPLANATION : The reaction of yellow turmeric powder with slaked lime converts it to red. Here turmeric powder is an acid-base indicator and slaked lime $Ca(OH)_2$ is a base.

PRECAUTIONS : Use only dilute solution of slaked lime.

8. LIGHT THE CANDLE BY MANTRA SHAKTI

MATERIAL REQUIRED : Chromic acid, methyl alcohol or ethyl alcohol, two candles, a table or stool.

PREPARATION : 1.2.3.4. Hold a candle No.1 in your left hand.Take half teaspoon chromic acid powder in your right hand and spread it on the top of the candle.Fix up this candle on top of the stool or table.Take candle No.2 and dip the top of this in methyl alcohol. (or ethyl alcohol if methyl alcohol is not available)

PERFORMANCE : 1.2.3.4. Take candle No.2 in your right hand and to attract the audience chant mantras.Touch the top of this candle with candle No.1 which is already fixed on the stool.You will find that both the candles start burning.Tell the audience that this is because of your *mantra shakti*.

EXPLANATION : Reaction of chromic acid with methyl alcohol/ethyl alcohol generates fire.

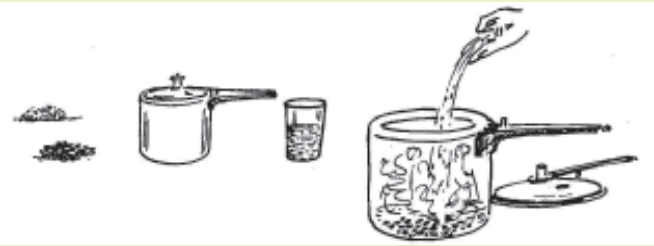
PRECAUTIONS : 1.2.3. Do not touch chromic acid with your fingers, if you do, there are chances that if you subsequently touch ethyel alcohol, you may burn your fingers.Keep all alcohol in airtight bottles, otherwise it will evaporate.Wash hands with soap after the performance.

9. COOKING RICE IN COLD WATER

MATERIAL REQUIRED : One fistful rice, pressure

cooker, one fistful calcium oxide (lime), one glass of water.

PREPARATION : Prior to the demonstration, soak the



rice for 25-30 minutes.

PERFORMANCE : 1.2.3.4.5.6.7.Take the pressure cooker and show the audience that it is empty.Put the rice in the cooker.Add one glass of water.Add calcium oxide (lime) to it taking care that the audience does not notice.Shake the contents well and close the cooker cover tight.Keep as it is for 5-6 minutes.Open the cover and find that the rice has been cooked without fuel and fire.

EXPLANATION : This trick is based on a simple chemical reaction. When calcium oxide comes in contact with water it reacts and produces heat and carbondioxide. This heat cooks the rice.

PRECAUTIONS : 1.2. The rice cooked in this way is not edible.Calcium oxide and other materials should be used in appropriate quantity.

10. SETTING FIRE TO THE HANDKERCHIEF WITHOUT BURNING IT

MATERIAL REQUIRED : A handkerchief, Isopropyl alcohol, match box, carbon disulphide (CS_2), carbon tetrachloride (CCI_4) solution

PREPARATION : 1.2. Take the abovementioned chemicals in equal ratio (1:1).Gently dip the handkerchief in the mixture.

PERFORMANCE : 1.2.3. Light the soaked handkerchief immediately after taking out from the solution.When the solution wetting the handkerchief has burnt or evaporated, immediately extinguish the fire.The handkerchief does not get burnt.

EXPLANATION : The trick is based on ignition temperature. When the hanky is wet with 1:1 mixture of above and held over a flame, the alcohol burns where ignition point is far less than cotton, when all the alcohol is burnt, the water remains with the hanky to keep it unburnt. Chemical reaction. When we light the handkerchief, the chemicals start burning, not the handkerchief.

PRECAUTIONS : 1.2.3.Take both the chemicals in equal quantity.Demonstrator should be alert. He should extinguish the fire as soon as he notices that the solution has evaporated.Both the chemicals are poisonous. To avoid danger use them carefully.

11. GHOST APPEARING ON THE GLASS SHEET

MATERIAL REQUIRED : White cloth (1m), a glass piece, flower or betel leaf, turmeric, lemon, chilly, akshat, potassium sulphocya-nide (2ml), ferric chloride (1 litre).

PREPARATION : 1.2.3.4. Spread a white cloth on the surface.Draw outline picture of an evil spirit on the glass with potassium sulpho-cyanide, let it dry.Place the glass on the centre of the cloth.Spread akshat, turmeric, etc., on the glass. Draw religious signs and symbols on the glass.

PERFORMANCE : 1.2. Chanting the mantras, calling

the evil spirit, throw wine coloured ferric-chloride solution on the picture of evil spirit. To spread the solution on the drawing use a flower or betel leaf.The picture will be visible due to the chemical reaction of potassium sulphocyanide and ferric chloride.

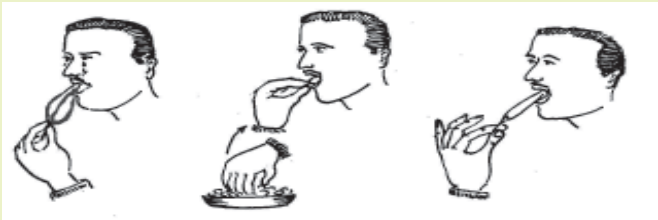
EXPLANATION : Prior to the demonstration the picture of evil spirit is drawn with the help of potassium sulpho-cyanide.

PRECAUTIONS : 1.2. The chemicals used are harmful. Use them carefully and wash your hand after the performance.Keep the chemicals out of reach of children.

12. EAT CHILLIES WITH EASE

MATERIAL REQUIRED : Olive oil or gurmar leaves (an ayurvedic herb) and chillies.

PREPARATION : 1. Gargle with olive oil or chew a few leaves of gurmar before the trick is performed.



PERFORMANCE : 1. Eat chillies. You will not feel any burning taste.

EXPLANATION : Unless the food is dissolved in saliva, experienced by taste receptors and registered by the brain, one cannot tell the taste. Illusion of taste is not created since olive oil coats the tongue and mouth. Similarly gurmar leaves make the receptors inactive and the taste of chillies is dulled.

PRECAUTIONS : 1.2. Eat the gurmar leaves only few moments prior to the performance.Practice well before the performance.

13. FIRE IN THE WATER

MATERIAL REQUIRED : A bucket filled ¾ with water, 3-4 sodium crystals, ether ½ cup, worship material, scented

stick, *dhoop, agarbatti.*

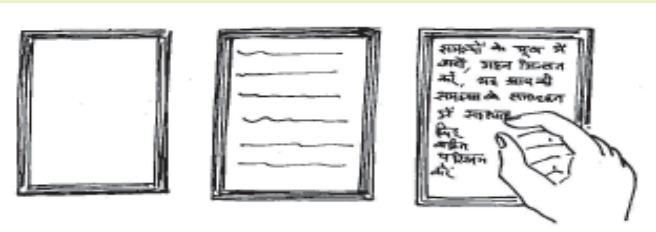
PREPARATION : 1.2.3.4.5.6.7. Perform yagna and havan while chanting mantras.Light scented sticks and *dhoop*.Take a bucket filled ¾ with water.Pour ½ cup of ether on the surface of the water.Hide 3-4 crystals of sodium in a handkerchief or betel leaf and chant *mantras*.Gently while chanting *mantras*, divert the attention of the audience and put the sodium crystals into the bucket.As soon as sodium comes in contact with ether red fire flames come out of water.

EXPLANATION : Ether is lighter than water and so it floats on water, when we drop sodium crystal into water, fire is generated and ether starts buring. The flame is observed due to reaction of sodium with water. Sodium is vigorously oxidized by water, high heat produces fire.

PRECAUTIONS : 1.2.3.4. Chemicals should be used in appropriate proportion and quantity.Chemicals should be kept away from the reach of children.Use metal bucket for the experiment.Wash your hands after the trick.

14. CREATE BLUE LETTERS ON PAPER

MATERIAL REQUIRED : A plain piece of paper (preferably coloured yellow or pink, but never blue, ferric



chloride solution, potassium ferrocyanide, brush or stick, a matchbox.

PREPARATION : 1.2.3.4. Take a piece of paper.Dip the brush into potassium ferrocyanide and write some words on paper and let it dry.Then dip your finger in the ferric chloride solution and touch the paper gently and rub the finger on the words.You will suddenly find the printed words are visible to the audience as bright blue.

EXPLANATION : This trick is a simple chemical reaction of ferric chloride and potassium ferrocyanide resulting blue complex product

$K_4Fe(CN)_6+Fecl_3$'!$4Kcl+Fe^{+2}+[Fe(CN)_6]^{-3}$

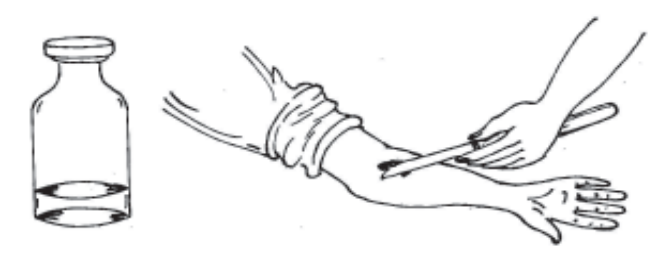
PRECAUTIONS : 1.2.3. The chemicals should be kept out of reach of children.These chemicals are poisonous and sometimes can prove to be very dangerous, so after using the solution you should wash your hand carefully.Do not use blue paper.

15. CUT THE BODY AND HEAL IT IMMEDIATELY

MATERIAL REQUIRED : Ferric chloride ($FeCl_3$), potassium Pot. thiocyanate, a knife, a small piece of cotton, a volunteer.

PREPARATION : 1.2. Apply the solution of Pot. thiocyanate on any part of the body and let it dry.Keep ready a knife which has been dipped in ferric chloride solution.

PERFORMANCE : 1.2. Act as if you have cut the body



part with this knife. After only a slight touch of a sharp knife you will see that thick 'blood' starts flowing from the cut.You know, why and how it happened. Cut is a simple chemical reaction. But the innocent viewer believes this is due to the power of the saint and worships him as the supreme power.

EXPLANATION : The solution of ferric chloride and potassium sulphocyanide react with each other and this results in the formation of blood-red ferric thiocyanide. This ferric-thio-cyanide which looks like blood to the viewers. $Fecl_3$ + 3NaCNS = Fe SCN + 3Nacl K (Red)(Ferric chloride) + (Potassium sulphocyanide) =Ferric thiocyanide + Potassium chloride (Red)

PRECAUTIONS :1.2.3.4. Chemicals should be kept away from the reach of children.The volunteer should be self-confident.The chemical should not be applied on any cut or wound which may be present on the body.The part of the body where the solution are applied should be washed immediately after the trick.

16. CREATING FIRE BY SPITTING

MATERIAL REQUIRED : Dry straw, small sized sodium piece (2 mm X 2 mm X 2 mm)

PREPARATION : 1. Hiding the small piece of Na should be done very carefully and smartly under dry straw. Hide

a very small piece of sodium (2 mm X 2 mm X 2 mm) in the straw at a known place.

PERFORMANCE : 1.2. Putting water should immediately follow; otherwise the straw may catch fire without water. The performer either spits or washes his hands with a little water at that very place.The flame will come out

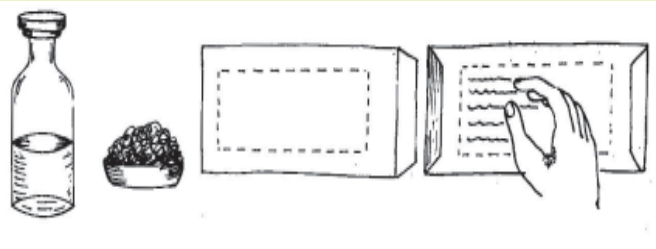
from dry straw.

EXPLANATION : The flame is observed due to reaction of sodium with water. Sodium is vigorously oxidized by water, high heat produces fire.

PRECAUTIONS : 1.2.3. The sodium piece should be small in size (2 mm X 2 mm X 2 mm), otherwise it may burst.Do not touch the sodium piece and preserve it in kerosene oil.The straw should be dry.

17. READ LETTER WITHOUT OPENING CLOSED ENVELOPE

MATERIAL REQUIRED : A piece of paper, a pen, an envelope, paste ether solution, a piece of cloth or cotton.



PERMORMANCE : 1. Prior to the demonstration light fire, dhoop, agarbatti and perform hawan.

2. Take a sheet of plain paper and pen, and ask a volunteer to write any question or sentence on it.

3. Put the paper in the envelope. Keep it flat without folding it. Show the envelope to the audience and close it carefully.

4. Then chant a few mantras pleasing the Goddess. Saraswati.

5. Take a cotton piece dipped in ether solution. Gently rub this cotton on the envelop without opening the seal. The written matter will be visible and you can read the matter easily.

EXPLANATION : It is a simple reaction involving ether solution. When it is applied to the envelope, the paper becomes transparent and the written matter is easily read.

PRECAUTIONS :1. Keep the paper in the envelope without folding it.

2. Rub the cotton wet with ether till the matter inside the envelope is visible.

18. BHIBHUTI FROM TABIZ (AMULET)

MATERIAL REQUIRED : Sealed aluminium amulet, mercuric chloride and alum or salt.

PREPARATION :1.2.3. Tie thread to the amulet so that

it may be tied on the volunteer's arm.Take 2-3 crystals of mercuric chloride and mix with similar quantity of alum or salt.Apply the mercuric chloride and alum powder on one side of the amulet through your middle finger in such a way that no one notice it.

PERFORMANCE :1.2.3. Press the amulet tightly on the arm of the volunteer and tie it with thread.The side which had been rubbed with chemicals should touch the body.The volunteer would feel the amulet growing hot and *bhabhuti* mark is seen on the arm. The size is of the size of the amulet.

EXPLANATION : The trick is based on sleight of hand. The reaction of mercuric chloride with alum generates the heat.

PRECAUTIONS : 1.2.3. Mercuric chloride is one of the strongest poison known. Better to avoid this presentation. It must be kept out of reach of children.Wash your hands with soap after the performance.Use aluminium amulet only.

19. OPERATING WITHOUT LEAVING ANY IMPRESSION OF STITCHES

MATERIAL REQUIRED : Ferric chloride, sodium sulphocyanide, leaf, surgical cotton, table, stones etc.

PERFORMANCE : 1. Call a volunteer and ask him to

lie down on the table. 2. Remove his shirt.

3. Stand keeping with your back to the audience to perform surgery.

4. Use ferric chloride solution as a cleaning agent.

5. Take sodium sulphocyanide solution on a leaf and use it as operating instrument.

6 . A line of blood will appear on the volunteer's body.

7. Now take some more sodium sulphocyanide in a pad of surgical cotton and apply to the wound.

8. Put fingers on stomach pressing in such a way that it looks pierced.

9. Take out stones, etc., already hidden in surgical cotton and show it to the audience.

10 . Now with the help of surgical cotton cleanthe so - called blood.

11 . Show the audience that stitches have healed and the person is cured.

EXPLANATION : The trick is based on sleight of hand as well as on chemical reaction. Read colour is obtained due to reaction of ferric chloride and sodium sulphocyanide.

PRECAUITONS : 1. Chemicals should be kept out of reach of the children.

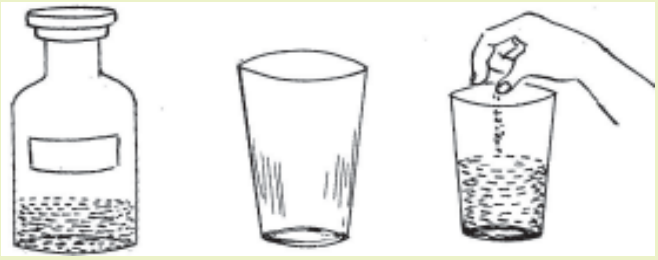
2.The chemicals are poisonous and sometimes very dangerous, so after using the solution you should wash your hands.

3. Do not apply the solution to cuts or wounds which may be present on the body of the volunteer.

20. CHANGE THE COLOUR OF WATER

MATERIAL REQUIRED : A glass of water, two steel glasses, thumb cap, 2-3 granules of potassium permanganate.

PREPARATION : 1. Wear the thumb cap and hide 2-3



granules of potassium permanganate in it.

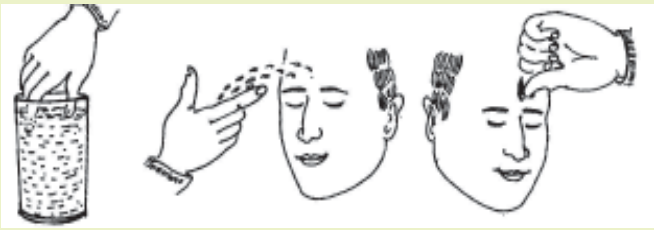
PERFORMANCE : 1.2.3.4. Hold a steel glass and half fill it with water.Take another glass and transfer the water from steel glass to the other glass. Repeat this process two to three times, just to impress the audience.While transferring the water from the steel glass to the other glass, gently and carefully put the granules of potassium permanganate in steel glass.The water will become coloured. Now keep chanting *mantras* and calling sidhha shakti pour it in the other glass.

EXPLANATION : Potassium permanganate is soluable in water and appears like blood when dissolved in water.

PRECAUTIONS : 1.2. To hide the thumb cap you should be careful in holding the steel glass and practice the style of pouring the water.While chanting *mantras* the volunteer should be quite stylish and full of expression.

21. PUT TILAK WITHOUT VERMILION

MATERIAL REQUIRED : Ferric chloride, sodium sulphocyanide.



PREPARATION : 1. Apply ferric chloride on your thumb before the performance of the trick.

PERFORMANCE : 1. Keep sodium sulphocyanide in a glass and tell the audience that this is water to be used for *tilk*.

2.Dip your thumb in water (sodium sulphocyanide solution).

3. Put thumb impression quickly on the forehead of the devotes.

4. It will appear as a red mark.

EXPLANATION : The red mark appears as a result of reaction of ferric chloride and sodium sulphocyanide.

PRECAUTION : Sodium sulphocyanide is a poisonous chemical, so wash your hands after use and keep it out of reach of the children.

22. PRODUCING BLOOD FROM LEMON

MATERIAL REQUIRED : A knife, a lemon, a syringe,

ferric chloride, sodium sulphocyanide, handkerchief.

PREPARATION : 1.2. Inject one syringeful of ferric chloride into the lemon prior to the demonstration.Apply sodium sulphocyanide on the knife with the help of the handkerchief.

PERFORMANCE : 1.2. Show the lemon and knife to the audience.Cut the lemon gently with the help of the knife. You will find a thick blood red solution coming out of the lemon.

EXPLANATION : It is the simple chemical reaction between ferric chloride and sodium sulphocyanide, which gives the red colour, that gives the effect of thick blood.

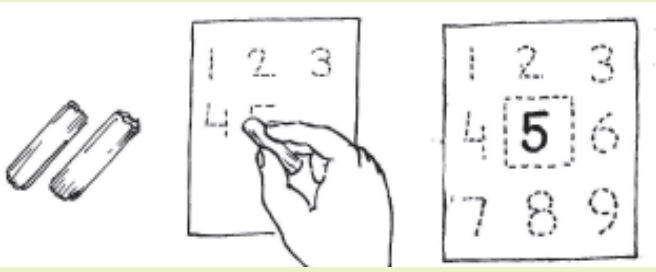
PRECAUTIONS : 1.2.3. Make sure that each segment of the lemon is injected with ferric chloride.Chemicals should be kept away from the reach of children.Wash hands with soap after the performance.

23. BHABHUTI WRITING

MATERIAL REQUIRED : Bhabhuti, soap, plain paper

PREPARATION :. Prior to the demonstrations write numbers from 1 to 9 on a few pieces of plain paper with soap.

PERFORMANCE : 1.2.3.4. Call a volunteer from the audience and tell him to ask for any number from 01 to 09 according to his wish.Then chant *mantras*, light *dhoop* to win the faith of the audience.Gradually, take the bhabhuti from the *yajna kund* and rub it on that paper which has the same number asked by the audience.You will find that the number will be visible on the paper.



EXPLANATION : The number written with the soap are not visible to the audience but when the paper is rubbed with *bhabhuti*, the number becomes visible.

PRECAUTIONS : 1.2.Write the number forcibly with soap prior to the demonstration.The demonstrator should be careful in picking only the paper bearing the number that has been indicated by the volunteer.

Virtual Philately -A New Tool for Science Population

Virtual philately is new, exciting and low cost method of pursuing world's most popular and educative hobby of postage stamps collection.

As a modern method of stamps collection, in place of real postage stamps in physical form, stamps images are copied and pasted which are freely available in numerous philatelic web sits free of cost. Using these images one can develop stamp collection and arrange it in sheets to display just like in actual philately. One can also participate in virtual philatelic exhibitions.

There is unlimited fun of virtual philately open to everyone- students, teachers, and parents who have basic working knowledge of computer and have availability of PC or laptop at home or in school with internet connection along with a genuine interest in learning and pursuing this hobby

Thus virtual philately–

1. Provides instant access to stamps of choice from any country of the world with just one click of the mouse.

2. Diversifies ones interest economically and with ease because it provides infinite choice of themes and topics of stamps collection.

3. Saves money and time in finding and purchasing stamps from market

4. Minimizes lots of care required to handle actual stamps

5. One has access to get images of even rarest and most expensive postage stamp of the world

6. Minimizes the problem of storage of actual stamps

7. One can view and show the collection at any time and to any one with the help of a CD.

8. Gives freedom to edit and improvement and to update the collection from time to time.

9. Provides excellent learning opportunity and educational value by accurate identification and knowledge about stamps collecting

10. Helps in learning scientific skill of classification and arrangement.

11. Provides valuable resource of learning about the world around with lots of pleasure and fun

12. Provides opportunities to be part of worldwide community of virtual philatelist and interaction with them.

13. Provides opportunities to participate in International virtual philatelic exhibitions (Exponet) and also in inter school philatelic Exhibitions such as SCHOOLPEX at Jaipur.

14. To present ones virtual collection as a Project in the school because philately is now recognized and promoted by CBSE

List of possible Themes for Virtual Philately

1. Animals-wild, pet, rare or endangered animals, Dinosaurs etc.
2. Cats, Dogs, Elephants, Camels, Lions etc.
3. Fishes, Whales, Equestrian etc.
4. Aircraft, Bicycles, Ships, Motorcars, Motorcycles, Railroads etc.
5. Science-scientists etc.
6. Inventors and Discoverers etc.
7. Chemistry and Physics, Physicists etc.
8. Mathematicians and Astronomers etc.
9. Birds. Peacocks etc.
10. Space, Astronauts etc.
11. Medical Science, Diseases etc.
12. Tourist spots of the world, Heritage Sites etc.
13. Olympic Games, Common Wealth Games, Asian Games
14. Mountains, Rivers, Glaciers, Lakes, Waterfalls, Oceans, Seas etc.
15. Music, Musical Instruments, Musicians etc.

How to prepare a virtual stamps album

If one now decides to pursue virtual philately and ready for it then sit down at internet connected computer along with a writing note book, pen and the above sheet of guide lines and follow the following steps-

- First write down the topic of interest on which one likes to collect stamps (one can select topics from the list in sheet also)
- Now switch on the computer and connect Internet. Open any search engine e.g.google and type "topical Philately "or any other link related to philately and search.
- Browse pages of that site and copy the images of desired stamps and save in a new picture folder and give the name of the theme to the folder. (One can also open other links if there is any, in the opened site)
- Also copy or note down brief description about each stamp, if given there below the images or note down from other sites.
- Save about 120-140 images of stamps on the theme from various links.
- Now once more use the pen and paper and write a brief introduction (20-25lines only) about the theme on which virtual collection of stamps is being prepared.
- **Always use white background of A-4 size sheet**

vertically to prepare a Virtual Collection.

- Now prepare the 'Plan or Introduction' page. Write down the title of the theme with black colour only in font size16, write brief introduction of the theme for which 20-25 lines were noted. **Do not use any other colour other than black.** This will be called page no 1.
- In the 'Plan or Introduction' page after the brief introduction in the space left make a table with the help of ms word. Enter the details of page wise subtitles and number of images shown on each page and brief description of subtitles.
- Prepare a 3x3 nine squares or rectangles table from the ms word on each A-4 size vertical sheet leaving some margins on each side. Hide the table later.
- Prepare different sheets for different subtitles, but not more than 16 for one frame. Write subtitles and all other descriptions in black colour only
- Now open the thematic folder of saved images, see their thumbnail view and thought fully copy/paste stamps in the squares or rectangles prepared in different sheets according to their sub titles.
- In each square or rectangle below the stamp image write down the brief description, which was noted earlier in black colour only. Letter size for description should be font size 12 and for subtitles font size14.
- Remember in one album page generally do not put more than 8-10 stamps images, otherwise sheet would be over crowded. Do not put images of actual size of original stamps; otherwise it will be called forgery.
- If possible copy one or two images of First Day Covers and Miniature Sheets, related to the theme and paste them also in appropriate sheets. This will add up the philatelic value of the collection.
- Put the sequence number of the other sheets.
- Write name, class and school, in right bottom corner of the 'Plan or Introduction' page.
- Finally review each page carefully and make necessary corrections, if any.
- Save the collection. Prepare two CDs one for submission to the exhibition authorities and one for future reference as a 'Master copy'.

One can also prepare a Power Point Presentation of the collection in the same manner (without using any weird effect)

Yogesh Bhatnagar- St. Xavier's Sr. Sec. School,

Jaipur 9414406609 (m)

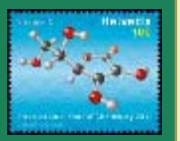
Some of the sites for Indian stamps are:-
www.merabharath.com/images/IndianStamps.gif
www.indianstampghar.com
www.indiapicks.com
www.stampsofindia.com

The 63rd UN General Assembly in December 2008 approved the year 2011 to be the International Year of Chemistry (IYC). The main theme of IYC 2011 is "Chemistry - Our Life, Our Future" focused on the achievements of chemistry and its contribution to well-functioning human society.A number of countries have released postal Stamp to commemorate the 2011 as IYC Years. A few of stamp are given below alongwith some comments.

(1)- Slovakia released a stamp commemorating the International Year of Chemistry. The Slovak chemical society at the Slovak academy of science released the stamp The basis of the stamp design is made up of two important chemical compounds, water and carbon dioxide, depicted according to the calotte model, which interact in photosynthesis.

(2)- Israel released a stamp on year of chemistry in Jan.2011.The image on the stamp, which is adopted from a paper published by Ada Yonath and her coworkers in 2001 in Nature magazine, shows a view into the tunnel of the large ribosomal subunit from which the newly constructed chain of amino acids exits. This huge structure shows the ribosomal proteins (shown in orange), the ribosomal RNA (blue and pink) together with the antibiotic erythromycin (red)

(3)- Bern, Switzerland (GenevaLunch) - New Swiss commemorative stamps as part of the UN Year of Chemistry, which is focusing on vitamin C. The stamp's motif is the vitamin C molecule. It was in 1933 at the Federal Institute of Technology (ETH) in Zurich that Tadeus Reichstein first succeeded in synthesizing the vitamin.



(4)- Technion Prof. Ehud Keinan, President of the Israel Chemical Society, had the vision to celebrate the international year of chemistry in a manner suited to the world-class position of Israel's three Nobel Laureates in science. With determination and application, he engineered the release of official stamps celebrating the Year of Chemistry, and Israel's Nobel Laureates

(5)- Ahmed Zewail on Egypt stamp (1998)

An Egyptian scientist Ahmed Zewail has won the

Prize in 1999 (probably he was nominated in 1998). Ahmed was declared the winner of Nobel

Prize in Chemistry 1999. He was awarded the Nobel "for his studies of the transition states of chemical reactions using femtosecond spectroscopy". Zewail is a Professor of Physics & Chemistry at California Institute of Technology, Pasadena.

(6)- Sir Cyril Norman Hinshelwood OM FRS (June 19, 1897–October 9,1967) was an English physical chemist.Professor of Chemistry at the University of Oxford from 1937. He served on several Advisory Councils on scientific matters to the British Government. He was elected Fellow of the Royal Society in 1929, serving as President from 1955 to 1960. He was knighted in 1948 and

appointed to the Order of Merit in 1960. With Nikolay Nikolayevich Semyonov of the USSR, Hinshelwood was jointly awarded the Nobel Prize in Chemistry in 1956 for his researches into the mechanism of chemical reactions.

The postal stamp released by diffrent countries to commemorate IYC 2011

Customized IYC Stamp

France IYC stamp- Jan 27, 2011

Belgium IYC- Jan 17, 2011

IYC Stamp from Spain-Feb. 7, 2011

Bosnia and Herzegovina Curie stamp (2011) March 8

IYC stamp- from Indonesia- March 1, 2011

Sri Lanka IYC stamp-Jan. 30 2011

IYC stamp from Indonesia-March 1, 2011

Macedonia chemistry stamp- April 13

The nice thing about chemistry is the way they named each of the elements after a famous letter.

Anonymous

Chemistry creates its objects, and this creative faculty is similar to that of art itself, (and) essentially distinguishes it from the natural and historical sciences.

Marcelin Berthelot

If you want to know more about Vigyan Prasar, its publications & software, besides the next moves of VIPNET Science Clubs, please write to us at the address given below:-

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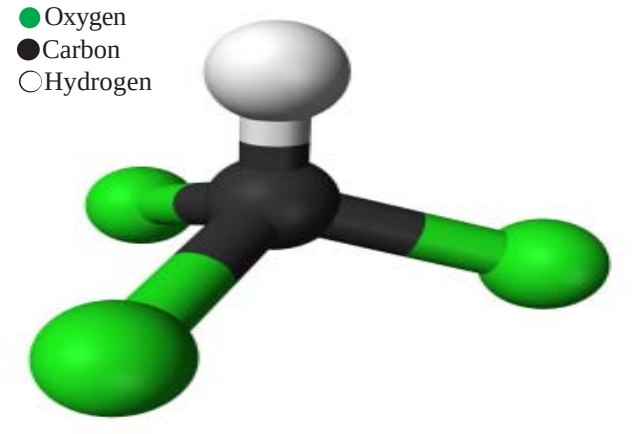
Email : vipnet@vigyanprasar.gov.in, info@vigyanprasar.gov.in
Website : http://www.vigyanprasar.gov.in

चित्र पहेली- 60 / Photo Quiz - 60

This year the photo quiz will be based on chemistry as part of **IYC 2011**



■ चित्र में दिये गए एक अणु की संरचना के मॉडल को पहचानिए? यह एक विलायक है जो प्रयोगशालाओं तथा औषधिय उद्योगों में बहुतायत से उपयोग किया जाता है?

■ Identify the Structural model of a Molecule given in the picture? It is a solvent used in Laboratories and Pharmaceutical Industires.

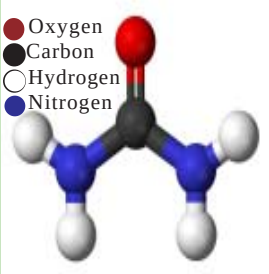
उत्तर प्राप्त करने की अंतिम तिथि: 31 जुलाई 2011

ड्रॉ द्वारा चयनित विजेताओं को पुरस्कार स्वरूप विज्ञान प्रसार के प्रकाशन भेजे जाएँगे। अपने जवाब इस पते पर भेजें:-

विपनेट चित्र पहेली - 60, विज्ञान प्रसार, ए-50, सेक्टर 62, नोएडा

VIPNET Photo Quiz , 60, VIGYAN, PRASAR, A-50, Sec. 62, Noida

Corrigendum/भूल-सुधार



चित्र पहेली 59 में भूलवश गलत चित्र प्रकाशित हो गया, इस कारण, चित्र पहेली 59 का पुनः प्रकाशन कर रहे हैं। इस चित्र पहेली के उत्तर प्राप्ति की अंतिम तिथि 31 जुलाई, 2011 है।

We are sorry for publishing wrong picture in Photo Quiz 59. Once again we are publishing the photo quiz no.59 with correct picture. The last date for receiving answer of this Photo Quiz will be July 31, 2011

■ चित्र में दिये गए एक अणु की संरचना के मॉडल को पहचानिए? यह पहला ऐसा कार्बनिक अणु है जिसका निर्माण अकार्बनिक तत्वों से किया गया था।

■ Identify the Structural model of a Molecule given in the picture ? This is the first organic molecule synthesized from inorganic salts.

Correct Answer of Photo Quiz 55

The plant shown in picture is Indian Alove (Alovera). In Hindi it is known as Ghekunvar, Ghrit Kumari. It is a common medicinal plant with succulent leaves. The plant is found through out the country.

Name of The Winners :- 1- Deepak Kholi (Lucknow), 2- Gangadutt (Chamoli), 3- Santosh Kumar (Amarwati),4- Kumari Anusha Neha (Chattisgarh)

Identify The Chemicals Element Puzzle 14

S	E	G	J	R	T	Y	V	A	D	E	S	S	D	R
T	A	R	G	O	N	C	D	C	R	S	O	A	C	C
C	G	Y	D	E	O	S	E	R	T	S	D	D	R	A
S	R	E	F	B	R	S	E	R	T	S	I	B	D	L
E	A	L	U	M	I	N	I	U	M	R	U	T	Y	C
S	D	F	B	H	Y	R	W	E	R	S	M	E	R	I
S	E	R	F	V	B	N	A	E	S	U	D	R	T	U
S	E	R	T	C	H	L	O	R	I	N	E	N	S	M
S	U	L	F	E	R	S	S	S	D	F	D	O	E	R
S	D	F	G	R	E	R	S	S	E	R	S	C	D	F
E	F	G	S	D	E	A	A	D	F	G	R	I	T	E
D	E	S	D	F	T	G	T	Y	U	H	D	L	F	R
T	T	Y	Y	O	D	F	G	R	S	R	T	I	S	D
C	G	E	P	H	O	S	P	H	O	R	U	S	R	T
S	D	F	R	E	F	S	E	T	R	S	D	T	E	R

Clue

1. The second least dense metal after Lithium.
2. A low density metal whose alloys are vital to the aerospace industry.
3. Eighth most common element in the universe by mass, but rare as free element in nature.
4. A pale yellow nonmetal occurring widely in nature and is used in rubber vulcanization.
5. A gaseous halogen, used widely to purify water, as a disinfectant and bleaching agent.
6. A highly reactive, poisonous, nonmetallic element occurring naturally in phosphates.
7. A noble gas which is the third most common gas in Earth atmosphere.
8. A silvery-white, lustrous, malleable, ductile, magnetic or magnetizable, metallic element occurring abundantly in combined forms, notably in hematite, limonite, magnetite, and taconite, and used alloyed in a wide range of important structural materials.
9. A highly reactive metal with the Symbol 'Na'
10. A soft gray alkaline earth metal, with atomic number 20

❑ R. K. Yadav
rky@vigyanprasar.gov.in

- Last date of receiving correct entries: 31 July, 2011.
- Winners will get activity kit/ books as a prize. Please send your entries to:-

Chemicals Element Puzzle-14, VIPNET News, Vigyan Prasar, A-50, Sector 62, Noida-201 307

The puzzle has been Designed as part of
International Year of Chemistry-2011

State Animal of India Puzzle-10

Name of the winners:

1- Vikash Kumar (Dharbhanga)

2- Shiv Kumar (Dharbhanga)

3- Vikash Kumar (Chapra)

Club speak

खगोलीय कार्यशाला का आयोजन

रिसेप्टिव एसेंशियल साइंटिफिक एजूकेशन एड्वांसमेंट रिसर्च कमेटी फॉर ह्यूमनिटी (रिसर्च) एवं जिला विज्ञान क्लब शाहजहाँपुर द्वारा आंशिक सूर्य ग्रहण पर खगोलीय कार्यशाला का आयोजन किया गया।

इस अवसर पर संस्था के निदेशक इरफान ह्यूमन ने बताया कि सूर्य की संतुलित ऊर्जा से ही पृथ्वी पर जीवन सम्भव है और सूर्य पर दिखाई देने वाले धब्बे चुम्बकीय क्षेत्रों का विशाल स्रोत होते हैं यहीं से सौर तुफानों का जन्म होता है। साथ ही उन्होंने कहा कि सूर्य ग्रहण से हमारे भविष्य, हित या अहित से कुछ लेना-देना नहीं है, यह एक प्राकृतिक घटना है।

कार्यशाला का संचालन करते हुए रिसर्च की सचिव रुफिया खान ने कहा कि कार्यक्रम का उद्देश्य लोगों में खगोलीय घटनाओं को लेकर अंधविश्वास को समाप्त कर वैज्ञानिक सोच का विकास करना है।

National Science Day

Sir C.V. Raman Science Club organized National Science Day celebration, 2011 at AB Municipal High School Proddature on 28-02-2011 at 10.00 AM.

In his inaugural speech the president explained that Science is nothing but curiosity of surrounding and look into everything with innovative mode.

Dr. J. Swaroop Krishna, the chief guest of the function, while speaking urged all the students who are pursuing education throughout the nation should have will power, efficiency and merit to become the future Scientists. Every individual must have positive attitude towards science in the development of our nation.

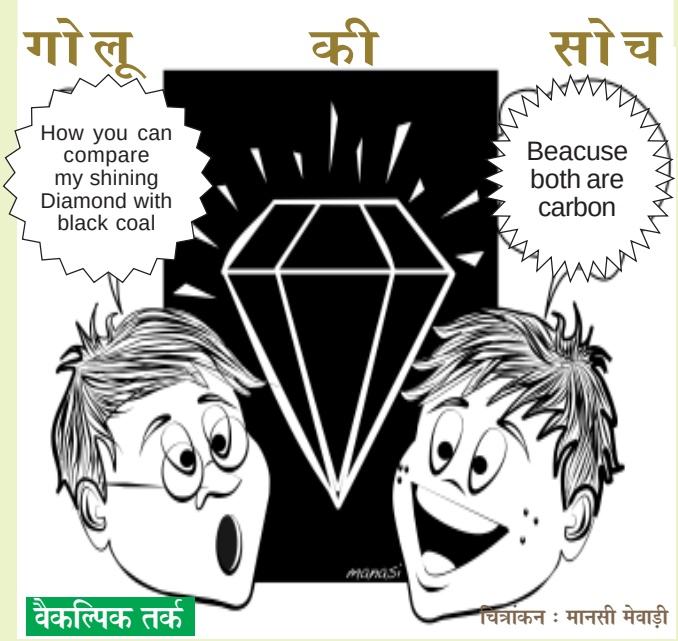
A dance performance based on theme 'Environment' was also given by the club members.

Arbor Day Celebration

Skylight Higher Secondary School, Pampore, Kashmir collaboration with the Social Forestry Department Pulwama, organized a function to celebrate the World Arbor Day in which the Deputy Commissioner Pulwama, Mr. Shafat Noor was the chief guest and the Superintendent of Police Awantipora was the Guest of Honour on 21 March, 2011 .

Skylight's Eco-Club members also presented colorful cultural programmes highlighting the importance of trees in our lives. Guests also planted various species of trees in the school campus.

The students of Skylight Higher Secondary School, Pampore also took out a mass awareness rally and also planted trees at Tehsil Office Pampore, in the public park near Sub-District Hospital, Pampore and on the local graveyard.



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