

a pipette. The instant this compound comes in contact with the flames it will put them out. This is because it forms a blanket of unburnable gas around the flames and so shuts out the oxygen (O). A new kind of hand fire-extinguisher that uses carbon tetrachloride (CCl_4) for the liquid is now on the market.

How to Clean Silverware Chemically. Put 1 teaspoonful of sodium thiosulphate¹ ($Na_2S_2O_3, H_2O$) in a test tube nearly full of water (H_2O) and shake it well. Now moisten a clean piece of cloth with the compound and with it rub the silverware to be cleaned. The film on it, which is silver sulphide (Ag_2S), will react with the sodium thiosulphate ($Na_2S_2O_3, H_2O$), causing thiosulphuric acid ($H_2S_2O_3$) to be set free and the sulphur (S) to be precipitated, both of which are easily wiped off, leaving the silver clean and bright.

How to Clean Silverware Electrically. Put the silver article to be cleaned in a zinc (Zn) or an aluminum (Al) pan or kettle and pour on enough water (H_2O) to cover it; this done, add 1 teaspoonful of sodium chloride ($NaCl$), which is common salt, for each pint of water (H_2O). This done, let the water (H_2O) in the pan or kettle boil for a couple of minutes, then take out the silver article and wash it in clean water (H_2O). It will then be as clean and bright as new. In this process, the reaction is an *electrolytic* one, that is, it is done by the action of an electric current, the pan or kettle serving as the negative pole, the silver article as the positive pole, and the salt solution as the battery solution, or *electrolyte*, as it is called. The film of

¹ This is the so-called hypo that is used for fixing negatives in photography. See Page 222.

silver sulphide (Ag_2S) on the article is removed by *electrolysis*, that is, it is deposited on the zinc (Zn) or aluminum (Al) vessel by electrolytic action.

How to Waterproof Goods. Make a solution by dissolving 1 teaspoonful of aluminum acetate ($Al(CO_2CH_3)_3$) in a test tube half full of water (H_2O), and then soak a strip of muslin in it. This done, hold the muslin for a few minutes over the spout of a teakettle from which live steam (H_2O) is issuing. The steam (H_2O) plus the aluminum acetate ($Al(CO_2CH_3)_3$) combines and forms aluminum hydroxide ($Al(OH)_3$), which is precipitated, and this fills the hollow fibers of the cotton and makes them non-absorbent to such an extent that water (H_2O) has little or no effect on the goods.

How to Fireproof Goods. All you need to do to make a piece of goods unburnable is to soak it in sodium silicate ($NaSiO_3$), or water-glass, as this compound is commonly called. If you want to fireproof a board, use a paint-brush and coat it with water-glass. The way to make water-glass is explained in Chapter XIV.

How to Make a Hair-Remover. Druggists sell *depilatory compounds* of various kinds for removing superfluous hair, but you can make one easily and cheaply that is guaranteed harmless. Get $\frac{1}{3}$ ounce of calcium sulphide (CaS) at the drug store and mix it with enough water (H_2O) to make a thick paste. Now spread this compound on that part of your face where the offending hair is and leave it there over-night. In the morning, the hair that you want to get rid of will be gone, and, your face will not be injured.

In this operation, the water (H_2O) and calcium sulphide

(CaS) react on each other and form calcium hydrosulphide ($Ca(OH)S$) and calcium hydroxide ($Ca(OH)_2$), that is, slaked lime. Now since both alkalis and hydroxides will decompose *proteins*, and as hair is made up of this substance, it is removed by them.

TABLE OF THE KNOWN CHEMICAL ELEMENTS AND THEIR SYMBOLS IN THE ORDER OF THEIR ATOMIC WEIGHTS

1	Hydrogen.....	<i>H</i>	48	Cadmium.....	<i>Cd</i>
2	Helium.....	<i>He</i>	49	Indium.....	<i>In</i>
3	Lithium.....	<i>Li</i>	50	Tin.....	<i>Sn</i>
4	Beryllium.....	<i>Be</i>	51	Antimony.....	<i>Sb</i>
5	Boron.....	<i>B</i>	52	Tellurium.....	<i>Te</i>
6	Carbon.....	<i>C</i>	53	Iodine.....	<i>I</i>
7	Nitrogen.....	<i>N</i>	54	Xenon.....	<i>X</i>
8	Oxygen.....	<i>O</i>	55	Caesium.....	<i>Cs</i>
9	Fluorine.....	<i>F</i>	56	Barium.....	<i>Ba</i>
10	Neon.....	<i>Ne</i>	57	Lanthanum.....	<i>La</i>
11	Sodium.....	<i>Na</i>	58	Cerium.....	<i>Ce</i>
12	Magnesium.....	<i>Mg</i>	59	Praseodymium.....	<i>Pr</i>
13	Aluminum.....	<i>Al</i>	60	Neodymium.....	<i>Nd</i>
14	Silicon.....	<i>Si</i>	61	Illinium.....	<i>Il</i>
15	Phosphorus.....	<i>P</i>	62	Samarium.....	<i>Sa</i>
16	Sulphur.....	<i>S</i>	63	Europium.....	<i>Eu</i>
17	Chlorine.....	<i>Cl</i>	64	Gadolinium.....	<i>Gd</i>
18	Argon.....	<i>A</i>	65	Terbium.....	<i>Tb</i>
19	Potassium.....	<i>K</i>	66	Dysprosium.....	<i>Dy</i>
20	Calcium.....	<i>Ca</i>	67	Holmium.....	<i>Ho</i>
21	Scandium.....	<i>Sc</i>	68	Erbium.....	<i>Er</i>
22	Titanium.....	<i>Ti</i>	69	Thulium.....	<i>Tm</i>
23	Vanadium.....	<i>V</i>	70	Ytterbium.....	<i>Yb</i>
24	Chromium.....	<i>Cr</i>	71	Cassiopeium.....	<i>Cp</i>
25	Manganese.....	<i>Mn</i>	72	Hafnium.....	<i>Hf</i>
26	Iron.....	<i>Fe</i>	73	Tantalum.....	<i>Ta</i>
27	Cobalt.....	<i>Co</i>	74	Tungsten.....	<i>W</i>
28	Nickel.....	<i>Ni</i>	75	Rhenium.....	<i>Re</i>
29	Copper.....	<i>Cu</i>	76	Osmium.....	<i>Os</i>
30	Zinc.....	<i>Zn</i>	77	Iridium.....	<i>Ir</i>
31	Gallium.....	<i>Ga</i>	78	Platinum.....	<i>Pt</i>
32	Germanium.....	<i>Ge</i>	79	Gold.....	<i>Au</i>
33	Arsenic.....	<i>As</i>	80	Mercury.....	<i>Hg</i>
34	Selenium.....	<i>Se</i>	81	Thallium.....	<i>Tl</i>
35	Bromine.....	<i>Br</i>	82	Lead.....	<i>Pb</i>
36	Krypton.....	<i>Kr</i>	83	Bismuth.....	<i>Bi</i>
37	Rubidium.....	<i>Rb</i>	84	Polonium.....	<i>Po</i>
38	Strontium.....	<i>Sr</i>	85		
39	Yttrium.....	<i>Y</i>	86	Radon.....	<i>Rd</i>
40	Zirconium.....	<i>Zr</i>	87		
41	Niobium.....	<i>Nb</i>	88	Radium.....	<i>Ra</i>
42	Molybdenum.....	<i>Mo</i>	89	Actinium.....	<i>Ac</i>
43	Masurium.....	<i>Ma</i>	90	Thorium.....	<i>Th</i>
44	Ruthenium.....	<i>Ru</i>	91	Protactinium(<i>Pa</i>) or (Ura- nium X).....	<i>Ux</i>
45	Rhodium.....	<i>Rh</i>	92	Uranium.....	<i>U</i>
46	Palladium.....	<i>Pd</i>			
47	Silver.....	<i>Ag</i>			

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