

Science Made Easy

COMMON CHEMICALS

In most cases it is not necessary to purchase expensive, reagent grade chemicals from scientific supply houses for use in elementary schools. Many chemicals are available locally, as indicated in the following table. Although many of these chemicals are not pure, often the fillers or other impurities will not affect the outcome of the experiment. Furthermore, use of such chemicals has an additional educational value - it shows students that you do not need special supplies to do many of the scientific activities. At the same time, though, it is important that the instructor and students handle **all** chemicals safely. In most cases, the smallest-sized container available should be purchased to avoid having excessive amounts of chemicals stored at school.

CHEMICAL	FORMULA	COMMON NAME	SOURCE	NOTES
Acetic acid	CH_3COOH	Vinegar (5% solution)	Grocery store	
Acetone	CH_3COCH_3	Nail polish remover, acetone	Hardware or paint store	Widely used solvent; flammable
Aluminum	Al		Aluminum foil, electrical wire, beverage cans	
Aluminum potassium sulfate	$\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$	Alum	Drug store	Used as an astringent to stop bleeding
Ammonia	NH_3	Household ammonia (about 10 M)	Grocery store	Common cleaning agent
Borax	$\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$	Borax, sodium borate	Grocery store	Used as a laundry product
Calcium carbonate	CaCO_3	Chalk, limestone, marble		
Calcium chloride	$\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$	Dust control, deicer	Hardware store	Very hygroscopic (absorbs water from air)
Calcium hydroxide	$\text{Ca}(\text{OH})_2$	Slaked lime	Hardware store	Used in the treatment of septic systems
Calcium sulfate	$\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$	Plaster of Paris, gypsum	Hardware store	
Carbon dioxide	CO_2	Dry ice (in solid form)	May be generated by adding an acid to any carbonate compound	
Copper	Cu		Electrical wire	Common house wiring is 14 gauge
Copper sulfate	CuSO_4	Bluestone	Hardware store, garden supply	Added to drains to kill roots Forms blue solution in water
Ethanol	$\text{C}_2\text{H}_5\text{OH}$	Denatured alcohol (95%)	Drug store	Usually you can substitute another alcohol, such as methanol or propanol
Hydrochloric Acid	HCl	Muriatic acid (10 M)	Hardware store	Acid is widely used to clean concrete
Hydrogen peroxide	H_2O_2	3% Hydrogen peroxide	Drug store	
Iodine	I_2	I_2 in KI solution of ethanol and water	Drug store	Tincture of iodine works fine as a test for starch
Iron	Fe		Filings may be obtained from a machine shop	

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CHEMICAL	FORMULA	COMMON NAME	SOURCE	NOTES
Lead	Pb	Lead shot, sinkers	Hardware store	
Magnesium hydroxide	Mg(OH) ₂	Milk of magnesia	Drug store	Magnesium hydroxide is only slightly soluble in water
Magnesium sulfate	MgSO ₄ ·7H ₂ O	Epsom salts	Drug store	
Methanol	CH ₃ OH	Methyl or wood alcohol, duplicator fluid, methyl hydrate	Hardware store	Toxic when ingested; flammable
Naphthalene	C ₁₀ H ₈	Some moth balls	Drug store, grocery store	Either of these can be used to demonstrate sublimation
Paradichlorobenzene	C ₆ H ₄ Cl ₂	Some moth balls	Drug store, grocery store	
Paraffin		Paraffin wax	Grocery store	
Phenolphthalein		Ex-Lax laxative (only the older preparation)	Drug store	Common base indicator; obtain from local high school or science supply company
2-Propanol	C ₃ H ₇ OH	Isopropyl alcohol, rubbing alcohol (70%)	Drug store	Usually found as a 70% solution (rest is water)
Sodium bicarbonate	NaHCO ₃	Baking soda	Grocery store	
Sodium bisulfate	NaHSO ₄	Toilet bowl cleaner, pH down	Grocery store, pool supply store	May be used as a solid acid
Sodium carbonate	Na ₂ CO ₃ ·10H ₂ O	Washing soda	Grocery store	Will slowly lose water of hydration if left in an open container
Sodium chloride	NaCl	Pickling salt	Grocery store	Table salt contains additives to make it free running; some do not dissolve
Sodium hydroxide	NaOH	Lye, drain cleaner	Grocery store, hardware store	Lye is the purer form of NaOH
Sodium nitrate	NaNO ₃	Nitrate of soda	Garden supply	
Sodium phosphate	Na ₃ PO ₄	Trisodium phosphate, TSP	Hardware store, grocery store	Fairly strong basic compound
Sodium thiosulfate	Na ₂ S ₂ O ₃ ·5H ₂ O	Hypo	Photo supply	Used in black and white photography
Sucrose	C ₁₂ H ₂₂ O ₁₁	Table sugar	Grocery store	
Sulfur	S	Flowers of sulfur	Hardware store, drug store	
Sulfuric acid	H ₂ SO ₄	Some drain cleaners, battery acid	Hardware store, auto supply store	Drain cleaner contains almost pure sulfuric acid (about 18 M)
Zinc	Zn	galvanized nails	Hardware store	