

PART 6 INFORMATION SECTION

Table showing formulas and names of some familiar elements and compounds

Language	H ₂ O	NaCl	H ₂ SO ₄	C ₂ H ₅ OH	Fe	Cu	S
English	water	sodium chloride (salt)	sulphuric acid	ethanol (alcohol)	iron	copper	sulphur
Nederlands	water	natrium chloride (zout)	zwavelzuur	ethanol (alcohol)	ijzer	koper	zwavel
Español	agua	cloruro de sodio (sal común)	ácido sulfúrico	etanol (alcohol)	hierro	cobre	azufre
Français	eau	chlorure de sodium (sel)	acide sulfurique	éthanol (alcool)	fer	cuivre	soufre
Deutsch	Wasser	Natrium chlorid (Salz)	Schwefel-säure	Äthanol (Alkohol)	Eisen	Kupfer	Schwefel
Português	Água	Cloreto de sódio (sal)	Ácido sulfúrico	Etanol (álcool etílico)	Ferro	Cobre	Enxofre
Svenska	vatten	natrium -klorid (salt)	svavelsyra	etanol (alkohol)	järn	koppar	svavel
Italiano	acqua	cloruro di sodio (sale)	acido solforico	etanolo (alcool)	ferro	rame	zolfo
Dansk	vand	natrium klorid (salt)	svovlsyre	ethanol (alkohol)	jern	kobber	svovl
Catalá	aigua	clorur de sodi (sal)	àcid sulfúric	etanol (alcohol)	ferro	coure	sofre

Suggestions from around the world for making a chemical product

These practical activities have been suggested by schools involved with the trials of the Chemistry In Our Lives topic. The practical activities are outlines only and teachers are recommended to find suitable examples in their own school or locality so that procedures can be carried out without serious risk, and according to the safety guidelines for their own classroom.

These practical outlines have been checked by the Safeguards in Science Committee in the UK; a service group for the Association for Science Education.

CALAMINE OINTMENT (SOUTH AFRICA)

Calamine ointment is zinc carbonate or oxide. When applied to the skin, it is used as relief from insect bites and sunburn, and from skin rashes of some diseases such as measles and chicken pox.

- Weigh 15g of calamine powder and 85g of white soft paraffin.
(These must be of pharmaceutical grade, not laboratory grade, if applied to the skin).
- Mix well until smooth.
- The local pharmacist recommends adding some vitamin C to preserve it.

ESTERS (POLAND)

Esters have sweet, fruity smells so they are used in food flavourings and perfumes. Giant molecule esters are in vegetable oils and fatty solids so they can be used in foods and in making soaps. Terylene, nail polish remover and many of the laminated plastics and surfaces on kitchen equipment are esters.

- Add 1ml of an organic acid such as ethanoic acid (corrosive) to 1ml of alcohol such as ethanol (highly flammable so keep away from naked flames).
- Stir gently and heat gently with a few drops of concentrated sulphuric acid.
- The resulting ester, ethyl ethanoate, smells sweet and fruity.



(Please note that concentrated sulphuric acid is highly corrosive so this step may be carried out by a teacher and eye protection should be worn).

GLUE FROM MILK (CANADA)

- Add 125 ml of skimmed milk to 25ml of vinegar and heat gently while stirring until small lumps begin to form.
- Remove from the heat and continue to heat until no more lumps form.
- Allow the lumps (curds) to settle.
- Filter the curds from the liquid (whey).
- Add 30 ml of water to the curds and stir.
- Add 0.5 teaspoon of baking soda/sodium hydrogencarbonate (to neutralise any remaining acid from the vinegar) until no more bubbles appear.

The resulting glue can be compared with other glues by testing its bonding strength on various materials.

PLANT DYES (USA)

(Based on an activity designed as part of the International Year of Chemistry Celebration)

Collect colourful, common, non-toxic plant samples (flowers, leaves, grasses, roots, bark and berries) from a safe source.

- For each colour, cut or grind the samples into small pieces (about the size of rice grains) and tie up into a small cloth bag.
- Place into a heating pot with 2 untreated cotton squares (about 10cm x 10 cm) and just cover with water.
(Rolls of cotton bandage are excellent sources of untreated cotton.)
- Heat, but do not boil for about 10 minutes. If the water level drops, add more water to keep the cotton squares covered.
- Allow the liquid to cool to room temperature, perhaps overnight.
- Using gloves, rinse the cotton squares in fresh water, until the water is colourless.
- Allow the cotton squares to dry.

The resulting dyed cotton squares can be tested for the dye's effectiveness as an indicator or for fastness, separately with various liquids such as vinegar, baking soda and water, hot water, soap and hot water, or detergent and hot water.

LAUNDRY SOAP FROM VEGETABLE OIL AND BANANA STALKS (SINGAPORE)

- Chop banana stalk into cubes about 2cm x 2cm and dry naturally (preferably in the sun).
- Burn and keep the ash.
- Mix about 15g of ash with 400ml of water and filter 5 or 6 times - to form the lye.
'Lye' is a term derived from 'alkali'.
- Warm about 75 ml of lye and 100 ml of vegetable oil, both to just over body temperature.
- Add 5ml of bleach to the lye and pour this solution into the oil while stirring for 10–20 minutes. The bleach provides the high pH necessary for the hydrolysis of the fat/oil.
- Add Ultra Downy (fabric softener) and stir until the soap mixture becomes thick.
- Pour the soap into moulds lined with paper or cotton dipped in cold water.
- Cover and keep warm for 24 hours.
- Remove from moulds and cut into bars.
- Age the bars for 2 to 3 weeks in a dry place before testing against other soaps.



(Bleach is an irritant or is corrosive depending on its concentration, so use eye protection. The soap product may contain residues of bleach, or have a high pH.)

NAIL POLISH LACQUER (PHILIPPINES)

- Cut 2g of photographic film into small pieces and place into 10ml of 10% sodium hydroxide to remove the coating.
- Wash and dry the film pieces.
- Add 15ml of ethyl acetate and stir until dissolved.
(Ethyl acetate is highly flammable so keep away from naked flames.)
- Keep overnight.
- Cut 2 gumamela flowers into small pieces.
- Grind and soak them in 5ml of ethyl acetate.
- Add just enough of the gumamela extract to 10ml of the overnight solution to get the desired colour.



(Please note that 10% sodium hydroxide is highly corrosive, so this step may be carried out by a teacher and eye protection should be worn.)