

Topic 10: Using resources

AQA GCSE Chemistry 8462 · spec 4.10 · sheets 10.1–10.4

Chemistry with a conscience

- Use resources without spending the future — that is sustainable development.
- Potable water is the first resource of all.
- LCAs, recycling, smart materials and the Haber process follow.

Potable water



desalination alternative: distillation or reverse osmosis — high energy cost

- Potable — safe to drink, but not pure.
- UK — source, filter beds, sterilise with chlorine, ozone or UV.
- Desalination where fresh water runs short — at an energy price.

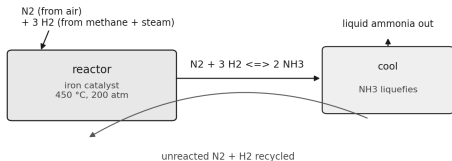
Life cycles and recycling

- Four LCA stages — materials, manufacture, use, disposal.
- Energy counts objectively; pollutant harm needs judgement.
- Reduce, reuse, recycle — in that order of preference.

Materials that last

- Corrosion — barrier it, or sacrifice zinc in its place.
- Alloys — bronze, brass, carats, steels, aluminium.
- Ceramics, polymers, composites — matrix plus reinforcement.

The Haber process



- N_2 from air + H_2 from methane and steam — over iron, 450°C , 200 atm .
- Ammonia liquefies out; unreacted gases recycle.
- (HT) every condition is a compromise of rate, yield and cost.

Feeding the world

- Ammonia becomes nitric acid; together they become ammonium nitrate.
- Potassium salts mined; phosphate rock treated with acid.
- NPK — the formulation that grows the crops.

Check yourself

- Checklist before you call this topic done.
- Water routes and sewage steps; LCA stages and their caveat.
- Alloys table; the Haber compromise with Le Chatelier.