

## Nylon: Teacher Notes

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### Nomenclature

Systematic names are not used on the plant.

Hexanedioic acid is called adipic acid and 1,6-diaminohexane is called hexamethylenediamine (HMD).

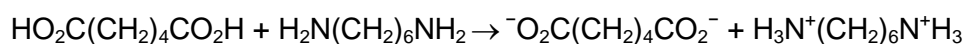
Some of the adipic acid produced is sold for making Nylon elsewhere.

### Cyclohexane oxidation

This occurs in two stages. In the first, air is bubbled through hot cyclohexane with a boric acid catalyst and a mixture of cyclohexanone and cyclohexanol is formed. The mixture is referred to as 'Ketone/Alcohol' (KA). The KA mixture is then oxidised further by hot nitric acid, using a copper/vanadium catalyst, to produce adipic acid.

### Nylon salt

The two monomers hexanedioic acid and 1,6-diaminohexane react together in two stages. The first stage is an acid-base reaction in which protons are transferred from the acid to the amine to form an aqueous solution called Nylon salt.



This salt is stable in aqueous solution and some of it is exported by sea to DuPont's plant in The Netherlands for polymerisation.

Polymerisation to Nylon is brought about by heating the Nylon salt under pressure in autoclaves where water is driven off.