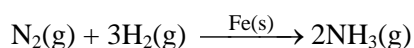


Resource 1 – Chapter 6**Heterogeneous and homogeneous catalysts****Heterogeneous catalysts**

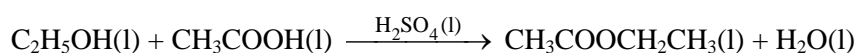
Heterogeneous catalysts are in a different physical state from the reactants. Generally, they are solid catalysts, which provide a surface on which the reaction can take place. For example, an iron catalyst in the Haber process for the manufacture of ammonia:



In this reaction, the reactants are gases but the catalyst is solid.

Homogeneous catalysts

Homogeneous catalysts are in the same physical state as the reactants. They generally act by forming an intermediate in the reaction. This intermediate reacts more easily than the original reactant. For example, the acid-catalysed formation of esters:



In this reaction, both the reactants and the catalyst are liquids.