NITRILES: PREPARATION

1. Nitriles can be made from
   a) halogenoalkanes,
   b) amides,
   c) aldehydes,
   d) ketones.

   For each of these types of reaction, give an example of the preparation of a nitrile containing four carbon atoms. Where you are asked for a structure, simple structures are OK – for example, \( \text{CH}_3\text{CH}_2\text{CN} \). In each case, give

   (i) the structure of the compound you are starting with,
   (ii) what you would react it with,
   (iii) the essential conditions for the reaction,
   (iv) the structure of the nitrile formed.

2. Why is the formation of nitriles in most of the ways covered in Q1 a useful thing to do in organic chemistry?