PHENYLAMINE: PREPARATION

1. The preparation of phenylamine from benzene is done in two stages:
   
   1. benzene to nitrobenzene
   2. nitrobenzene to phenylamine

   a) State the reagents and the important condition for the first stage of the preparation.

   b) Explain the need for the condition that you have quoted.

   c) Write the equation for the reaction.

   d) The second stage from nitrobenzene to phenylamine is itself a two step process. Give the reagents and conditions for each of those steps.

   e) Explain the need for the second of these two steps.

   f) Write the electron-half-equation for the reduction taking place in the first of these steps.

   g) Write a simple ionic equation for the second of these steps.