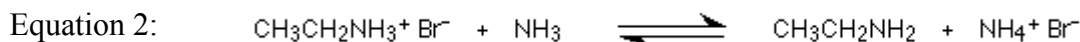
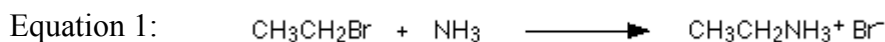


## Chemguide – questions

### HALOGENOALKANES: REACTIONS WITH AMMONIA

- Halogenoalkanes react with ammonia to form amines, which come in three kinds – primary, secondary and tertiary. Draw the structures of
  - a primary amine based on the methyl group,  $\text{CH}_3$
  - a secondary amine based on a methyl group and an ethyl group,  $\text{CH}_3\text{CH}_2$
  - a tertiary amine based only on methyl groups
- Give the conditions for the reaction of bromoethane with ammonia.
- When bromoethane reacts with ammonia, the equations for the initial reaction (taken from the Chemguide page) are



- What type of compound is the product in the first equation? Name it.
- Explain what is happening in the second equation.
- Like ammonia, the organic product of the second reaction can also react with bromoethane in a similar pair of equations. Write those equations, making sure that you show the structure of the products clearly.
- More reactions can occur, leading to various other products, getting increasingly complicated. Draw the structure of the *final* organic product in the sequence.
- Suppose you wanted to maximise your chances of forming mainly ethylamine (the organic product in equation 2 above). How would you achieve that? Explain your answer.