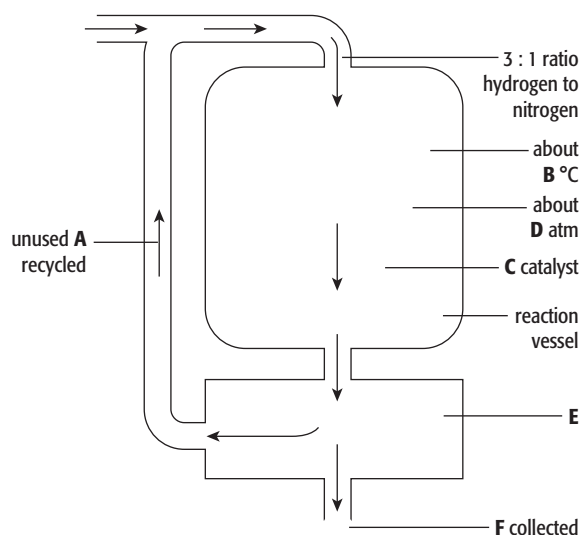


Worksheet 9.3

The Haber process

1 Consider the diagram of the Haber process below. Assign the labels below the diagram to the positions A–F.



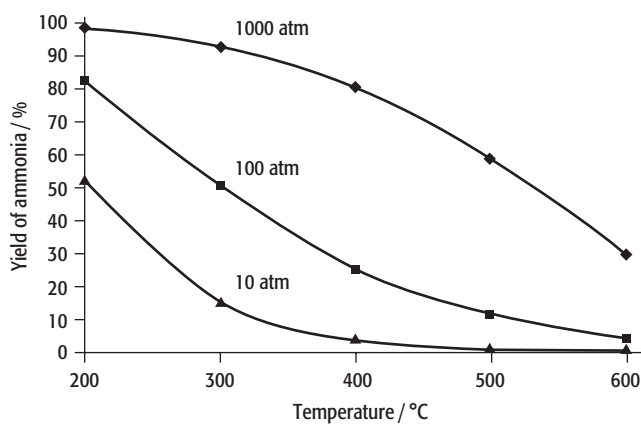
200 450 condenser hydrogen and nitrogen iron liquid ammonia

A = B =

C = D =

E = F =

2 The graph shows how changing conditions of temperature and pressure affect the yield of ammonia in the Haber process.



a What is the yield of ammonia at 300 °C and at:

i 10 atm pressure?

.....

ii 100 atm pressure?

.....

iii 1000 atm pressure?

.....

b Which conditions seem to give the best yield of ammonia?

.....

c Why are these not the normal operating conditions for the Haber process in industry?

.....

.....

d What is the % yield of ammonia likely to be at the normal operating conditions of 450 °C and 200 atm and why are these conditions used?

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