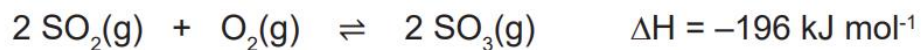


Ammonia, NH_3 , is an industrially-important chemical. It is produced on an industrial scale by the Haber process. The reaction for the Haber process is shown below.



23. The Contact process, which is used to produce sulfuric acid, is another industrially-important process. The process contains several steps, one of which is the production of sulfur trioxide, SO_3 , as shown below.



Which statement regarding both the Haber and Contact processes is correct?

- (a) Both are exothermic and both need a suitable catalyst to occur at a satisfactory rate.
- (b) Both are endothermic and both need a suitable catalyst to occur at a satisfactory rate.
- (c) Both need a suitable catalyst so that the yield of their respective products is maximised.
- (d) Both can achieve high rates and high yields without the need for a catalyst.