

Potential Energy Diagrams

1. Consider the following potential energy diagram for the reaction $A + B \rightarrow P$



- a) How many reaction steps?
3
- b) How many intermediates?
2
- c) How many transition states?
3
- d) Which is the rate determining step?
Step 2
- e) Which is the fastest step in the forward reaction?
Step 3
- f) Which step has the smallest rate constant in the forward direction?
Step 2
- g) Is the overall reaction endothermic or exothermic?
endothermic
- h) What is the difference between an intermediate and a transition state?
An intermediate is lower in energy than a transition state. An intermediate has fully formed bonds, while a transition state has partial bonds which is why it is higher in energy.
- i) How many elementary reactions?
3