Enzymology

# Effect of inhibitors on enzymatic reactions

The following reaction is catalyzed by the enzyme catalase: 2H2O2 → 2H2O + O2

In a series of experiments examining the effect of inhibitors on catalase activity you obtain the following results (assuming [catalase] remains constant).

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| **[INHIBITOR] (M)** | **CATALASE ACTIVITY (mean±sd O2 ml/s)**  |
| **Substrate (H2O2) concentrations**  |
| **0.20 M** | **0.40 M** | **0.80 M** |
| **No inhibitor** | 0.89±0.07 | 1.65±0.13 | 2.97±0.28 |
| **Copper sulphate****0.06** | 0.88±0.07 | 1.61±0.11 | 2.97±0.27 |
| **0.31** | 0.42±0.03 | 0.52±0.03 | 0.54±0.04 |
| **0.62** | 0.11±0.01 | 0.13±0.02 | 0.09±0.01 |
| **Cyanide (hydrogen cyanide)** **0.04** | 0.89±0.08 | 1.64±0.13 | 3.01±0.28 |
| **0.16** | 0.400±0.04 | 1.21±0.09 | 2.31±0.19 |
| **0.40** | 0.09±0.01 | 0.98±0.08 | 1.89±0.20 |

1. Draw 2 graphs that show, in the most appropriate way, the effect of these 2 types of inhibitors on catalase activity. Label your graphs appropriately.
2. What type of enzyme inhibition is supported by the above results for copper sulphate? Cyanide? Explain.