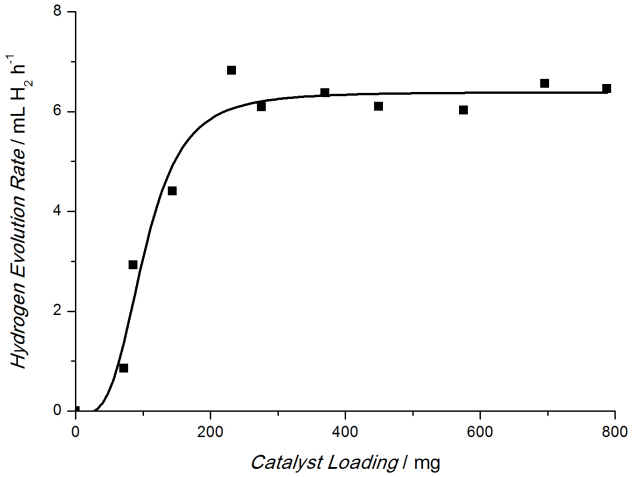
Marks
2

- When irradiated with visible light, CdS can catalyse the production of H_2 from water.

$$H_2O + \text{light} \xrightarrow{CdS} H_2 + \tfrac{1}{2}O_2$$

The rate of H_2 production from 80 mL of water at constant illumination varies with the amount of catalyst present (*i.e.* CdS loading) as shown below.



Why does the rate of H_2 production as a function of catalyst loading plateau?

Energy from light causes the water to split. The energy input is constant and this determines the maximum rate of reaction. (Essentially, light is the limiting reagent.)

Increasing the amount of catalyst increases the amount of light captured (0 - 200 catalyst loading), but cannot increase it above the amount being provided (plateau region).

THE REMAINDER OF THIS PAGE IS FOR ROUGH WORKING ONLY.