Cellulose, Enzymes, and Platinum Group Metals

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Abstract

The platinum group metals platinum, ruthenium, and palladium vary widely in their effects on both cellulase enzymes and their cellulosic substrates. The palladium complex hexachloropalladate inhibited the enzymatic hydrolysis of cellulose and xylan while the corresponding platinum and ruthenium complexes did not. The inhibition of catalysis did not impair enzyme binding to cellulose. The complexation of pentaammineruthenium with histidine residues of certain proteins endowed them with the oxidoreductase activity characteristic of this complex. A synergistic increase in hydrolysis of lignocellulose was observed when pentaammineruthenium-modified proteins were added to enzyme mixtures.