

Vanadium(IV) complexes with methyl-substituted 8-hydroxyquinolines: catalytic potential in the oxidation of hydrocarbons and alcohols with peroxides and biological activity.

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Streszczenie

Methyl-substituted 8-hydroxyquinolines (Hquin) were successfully used to synthesize five-coordinated oxovanadium(IV) complexes: [VO(2,6-(Me)₂-quin)₂] (**1**), [VO(2,5-(Me)₂-quin)₂] (**2**) and [VO(2-Me-quin)₂] (**3**). Complexes **1–3** demonstrated high catalytic activity in the oxidation of hydrocarbons with H₂O₂ in acetonitrile at 50 °C, in the presence of 2-pyrazinecarboxylic acid (PCA) as a cocatalyst. The maximum yield of cyclohexane oxidation products attained was 48%, which is high in the case of the oxidation of saturated hydrocarbons. The reaction leads to the formation of a mixture of cyclohexyl hydroperoxide, cyclohexanol and cyclohexanone. When triphenylphosphine is added, cyclohexyl hydroperoxide is completely converted to cyclohexanol. Consideration of the regio- and bond-selectivity in the oxidation of n-heptane and methylcyclohexane, respectively, indicates that the oxidation proceeds with the participation of free hydroxyl radicals. The complexes show moderate activity in the oxidation of alcohols. Complexes **1** and **2** reduce the viability of colorectal (HCT116) and ovarian (A2780) carcinoma cell lines and of normal dermal fibroblasts without showing a specific selectivity for cancer cell lines. Complex **3** on the other hand, shows a higher cytotoxicity in a colorectal carcinoma cell line (HCT116), a lower cytotoxicity towards normal dermal fibroblasts and no effect in an ovarian carcinoma cell line (order of magnitude HCT116 > fibroblasts > A2780).

Słowa kluczowe

vanadium(IV) complexes, biological activity, catalytic properties, 8-hydroxyquinoline, cytotoxicity studies

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