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Metal Complexes of the Tetraethyl Ester of 4-(2-Hydroxyphenylamino)-1,3-butadiene-1,3-diphosphonic Acid and the Liquid Phase Oxidation of Cumene in their Presence

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Metal Complexes of the Tetraethyl Ester of 4-(2-Hydroxy-phenylamino)-1,3-butadiene-1,3-diphosphonic Acid and the Liquid Phase Oxidation of Cumene in their Presence

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The tetraethylester of 4-(2-hydroxy-phenylamino)-1,3-butadiene-1,3-diphosphonic acid **3** and its zinc and cobalt complexes (**3-Zn**, **3-Co**) have been synthesized and their structures were determined by IR, $^1\text{H-NMR}$, $^{31}\text{P}\{^1\text{H}\}$ -NMR and $^{13}\text{C-NMR}$ spectral investigations. The affect of these compounds on the liquid phase oxidation of cumene is studied and compared with that of 2-aminophenol **2** and its metal complexes **2-M**. It is found that the ligand **3** shows the strongest inhibiting effect, while **3-Co**, **3-Zn** and **2-Co** accelerate the oxidation process. The strong inhibiting effect of the ligand **3** is due to its possibility to react with cumeneperoxide radicals. The disappearance of inhibiting properties in the complexes **3-Zn** and **3-Co** shows that electrophilic attack of cumeneperoxide radicals is directed to OH or NH groups of **3**. Most probably the OH group is affected because a similar absence of inhibiting properties is inherent to the **2-Co**. The presence of inhibiting properties of the **2-Zn** as opposed to **2-Co** could mean that this complex (**2-Zn**) has a more complicated, still unknown structure, possibly a polymeric one.