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 O_2 in the ground state [1, 2] or in one of its excited states [3] is usually formed in the decomposition of H_2O_2 catalyzed by transition-metal compounds. The formation of ozone was not observed, although reaction (1) is thermodynamically allowed ($\Delta G_{2,98}\circ = -188$ kJ/mole) [4]

$$3H_2O_2 \rightarrow 3H_2O + O_3 \tag{1}$$

We have found that the disproportionation of 1.2 M H_2O_2 in a mixture of acetic acid and acetic anhydride in the presence of 0.001 M VO(AcAc)₂ at 20°C is accompanied by the formation of ozone identified by UV spectroscopy relative to its absorption maximum at 253 nm. The ozone yield evaluated relative to the consumption of 1-hexene [5] was about 1% of the total gaseous products of the decomposition of H_2O_2 . The yield of O_3 in $CF_3CO_2H^-(CF_3CO)_2O$ for the same catalyst concentration and temperature is 10-14%. The introduction of 0.2-2 M CF_3CO_2Na does not block reaction (1). The addition of 2 M H_2SO_4 and 0.7 M $HCIO_4$ to $AcOH^-Ac_2O$ completely suppresses the formation of O_3 . These findings indicate that the protonation of H_2O_2 , which may result in the generation of HO^+ ions, is not responsible for the formation of O_3 . Most probably, O_3 is liberated as a result of the inner-sphere disproportionation of V(V)peroxo complexes.

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