

# KINETICS AND MECHANISM OF MORPHOLOGY AND OXYGEN REDUCTION REACTION AT PdCo ELECTROCATALYSTS SYNTHESIZED ON XC72

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## ABSTRACT

The Kinetics and mechanism of morphology and oxygen electro reduction reaction at PdCo catalysts synthesized on carbon black XC72 have been investigated. The effect of annealing temperature and aging time on the catalytic activity and stability were studied in more details. It is found that, the average particle size increases with increasing the aging time and leads to decrease the catalytic activity. The optimal heat-treatment temperature is found to be 300 °C for 3 h in the case of higher percent of Co and in the case of lower percentage of Co it is found to be 700°C for 4 h. The highest oxygen reduction reaction (ORR) catalytic activity, are obtained. A typical transmission electron microscopy (TEM) micrograph of the (Pd<sub>32</sub>Co<sub>68</sub>/C) catalyst, heat-treated at 300 °C aged at different times reveals that the average particle size is 25 nm with a relatively narrow size distribution.

**KEYWORDS:** Nanostructures, Chemical Synthesis, Surface Properties, Electrochemical Properties, Electron Microscopy