P22- Catalytic activity of MWCNT-based inks synthetized by different methods

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Research on new catalyst materials for the oxygen reduction reaction (ORR) is the main goal for many research groups around the world, due to its application in fuel cells and metal/air batteries. ORR mainly occurs by two pathways, in alkaline media, the direct four-electron transfer pathway from O_2 to OH^- or in a two-steps mechanism, where hydrogen peroxide (HO_2^-) is formed in the first reaction. On fuel cells and metal air batteries applications, the catalyst must be optimized to get the oxygen reduced directly to water through the 4 electrons mechanism[1]. Due to high price of the precious metals, new materials are tested to be used as catalyst in ORR. Among them, researchers have focused their attention mainly on metal oxides, perovskites or carbonaceous materials.

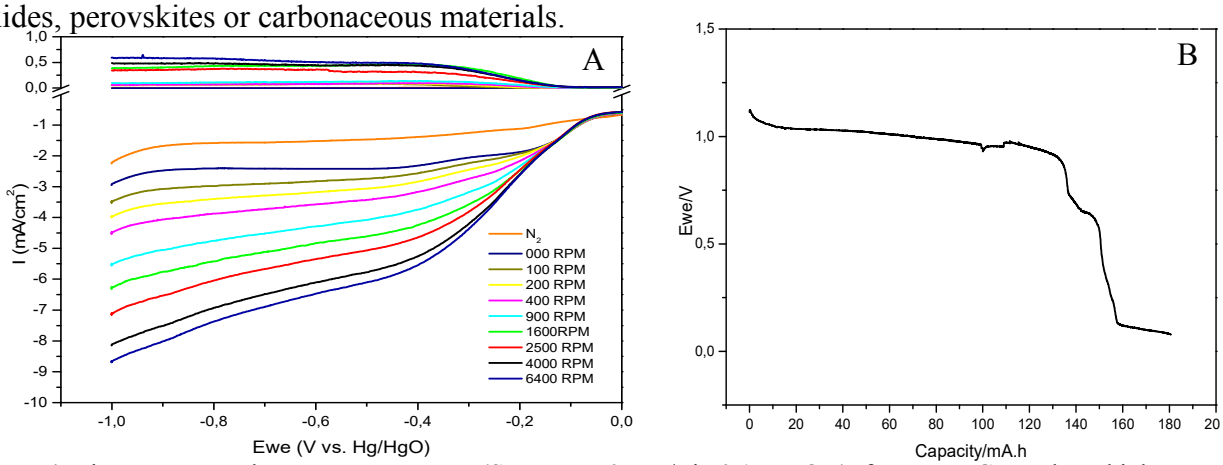

Figure 4: Linear sweep voltammograms curves (Scan rate 50 mV/s in 0,1M KOH) for a MWCNTs based ink (left) and, discharge of a zinc-air battery at -10 mA/cm^2 using the same ink as catalyst in the air electrode (right).

In this communication, we have studied four carbonaceous-based inks synthetized by ultrasonic or hydrothermal methods[2], using a rotating ring-disk electrode (RRDE) (Figure 1.A). The production of HO_2^- (%HO_2^-), transferred electrons and others parameters will be analyzed and the results will be discussed in depth. Finally, the inks were used as catalysts in the cathode of a PVA-KOH-based zinc/air batteries to replace the most widely used catalyst to date, MnO_2 (Figure 1.B).

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