Different catalytic membrane reactors (CMRs) were obtained from hollow fiber membranes corundum and palladium nanoparticles obtained by different methods: Incipient wetness impregnation , sputtering , microemulsion and copper alloy by the method of the polyol. The CMRs were tested in aqueous medium, ambient pressure and ambient temperature or 60C for the in situ generation of hydrogen peroxide, oxidation and hydrogenation of phenol and ibuprofen and reduction of Cr(VI). The catalytic CMR acted as interface for the reactions between hydrogen with oxygen or organic or inorganic compound. Only the CMRs with palladium by impregnation were actives and stabilites during the tests. This behavior occurred thanks to the presence of clusters and single atoms of palladium. The lack of activity of the other kind of palladium catalysts were due to the formation of palladium hydride in the reaction conditions.