Atomic Structure of Hydrous Ruthenium Oxide Coating on Ti and CNT Substrate by Cathodic Deposition Method

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Abstract

In this study, hydrous ruthenium oxide was deposited on titanium(Ti) and carbon
nanotube(CNT) substrate by cathodic deposition method. Combination of amorphous and
nanocrystalline structure of hydrous ruthenium oxide was investigated by high resolution electron microscopy. The measured capacitance was found keeping nearly constant through charge/discharge processes for hydrous ruthenium oxide coating on Ti substrate. On the other hand,thin and uniform layer of hydrous ruthenium oxide coating can be deposited on CNT substrate. The thickness of the coating layer was found less than 10nm. Combination of amorphous and nanocrystalline structure of hydrous ruthenium oxide was also investigated on this specimen. The consumption of coating was found very effective for this specimen after 105 charge/discharge cycles which lead to the tremedenously decreasing in the measured capacitance.

Keyword：Hydrous ruthenium oxide, CNT, Cathodic Deposition Method, Atomic Structure