Experimental Details

The anodization has been carried out at room temperature (27°c)for two hours at a constant voltage of 50V, in a two electrode system with mirror polished titanium foil both as working electrode and counter electrode and 0.5 wt % ammonium fluoride and 2 vol % de-ionized water in ethylene glycol as electrolyte. The distance between the working electrode and counter electrode is maintained at 3 cm.The surface deposited nanograss has been removed by ultrasonic cleaning in deionised water. The as prepared nanotubes are air annealed at 500°c for 3 hours. For Zn incorporation in the three electrode system, a negative voltage of 2.5V has been applied to the titanium dioxide nanotube with 1 M zinc sulphate solution as electrolyte for time periods ranging between 1s to 10s. The annealing of amorphous tubes in air is done at 500°C for 3 hours. For ZnO removal from surface, Zn-TONT has been dipped in 1 M HCl solution for one hour.

Texture coefficient

The texture coefficient corresponding to each XRD peak is given in general by the

equation 1 [1,2]

$$C_{hkl} = \frac{N(I_{hkl}/I_{r,hkl})}{\sum\limits_{i=1}^{N}(I_{hkl}/I_{r,hkl})}$$

where N is the number of reflections in the XRD, C_{hkl} is the texture coefficient of plane (hkl), I_{hkl} is the measured integral intensity of the plane (hkl) under discussion, $I_{r,hkl}$ is integral intensity for a sample with completely randomly oriented (hkl) plane (taken from the JCPDS file-89-4203). The texture coefficient C_{hkl} gives a measure of the enhancement of reflections from (hkl), in comparison with a completely randomly oriented sample. For randomly oriented samples, the texture coefficient is one. That means, a value of texture coefficient greater than one denotes the preferential orientation of that particular plane.

References

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