varied between 15 and 30 volts, during 40 minutes to 6 hours. The obtained structures were characterized by X - ray Diffraction and scanning electron microscopy.
We have recorded the variation of the current density against time during the anodization. These curves showed similar shapes: we first note a decrease of the current density followed by stabilisation, and then an increase of the current density. The minimum of the current density depends on the applied voltage.
Microstructural studies carried out by scanning electron microscopy showed that the pore diameter was about 75 nm and depended on the anodization voltage and time. Elemental analysis by energy dispersive X-ray microanalysis revealed the obtained nanoporous matrices are mainly titanium oxide. The results of the evolution of their structure as revealed by X ray diffraction will be presented as function of the various anodization parameters.

MS37 P09

Electrodeposition of films and multilayer of Bi and Te
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Keywords: Thin film, electrodeposition, XRD

The thermoelectric power coefficient of a alloys and semiconductor compounds is extremely sensitive to there microstructure and the composition.
In this wok we have used electrochemical deposition of thin films of thermoelectric material Te (Tellurium) and Bi (Bismuth) and multi-layers Bi/Te/Bi/Te.....
Bismuth and tellurium films were electrodeposited potentiostatically on nickel or ITO substrates using an acidic solution containing Bi^{3+} and $HTeO^-_2$ ions in 1M nitric acid (pH~1). A platinum sheet was used as counter electrode. A potentiodynamic study was performed to find the deposition potentials of the various compounds. It was found that a potential of -0.35 V/SCE was used for the deposition of both Bi, Te Bi/Te multilayers. The obtained films were characterises by X-ray diffraction, scanning electron microscopy and X-ray microanalysis in the energy dispersive mode. The deposited films adhered well to the substrate and their surfaces were rather smooth. The results of the structural studies are discussed.

MS37 P10

Characterization of Structural, Optical and Electric Properties of TiO_2 Thin Films Prepared by Reactive DC Magnetron Sputtering
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At the present moment, many researchers focus their studies on thin solid films of TiO_2 who presents very interesting optical, electrical and chemical properties. These properties make it suitable for wide applications such as photo–catalysts, electronic, optical wave guides, and photochemical solar cells [1–3] for the solar energy transformation into electricity. TiO_2 films can be produced by many methods, such as reactive evaporation [4], PACVD [5], reactive DC magnetron sputtering [6] this latter has gained significant importance for depositing a variety of hard coatings. This is due to the ease of control over the stoichiometry of the deposited film, and so on. In this study, we interested ourselves in the study of structural and optical properties of TiO_2 thin films prepared by reactive DC magnetron sputtering. For this purpose, we studied the evolution of the refractive index, porosity, grain size, and crystal structure of TiO_2 thin films obtained for different deposition time and annealing temperatures. XRD and Raman analyzes of our thin films of TiO_2 show that at deposition time 60 min crystallize in the phase anatase, starting from the temperature of annealing 350°C. The size of the nano–crystals varies from 12.6 to 18.6 nm. The index of refraction (n), and porosity (p) are calculated starting from the measured transmission spectra, and vary between 2.10 and 2.32 for (n), and from 36.1 to 17.9% for porosity (p). Our films, irrespective of treatment temperature and deposition time, are transparent in the visible range and opaque in the UV region.

[1] Takeda S; Suzuki S; Odaka H; Hosono H; *Thin Solid Films.* 2001, 392, 338.
[2]. Brown W.D; Granneman W.W; *Solid State Electron.* 1978, 21, 837.
[3] Siefering K.L; Griffin G.L; *J. Electrochem. Soc.* 1990, 137, 1206.
[4] Lobl P; Huppertz M; Mergel D; *Thin solid Films.* 1994, 251, 72.
[5]. Frenck H.J; Kulisch W; Kuhr M; Kassing R; *Thin Solid Films.* 1991, 201, 327.
[6] Meng L.J; Santos M.P; *Thin Solid Films*. 1993, 226, 22.