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Structure and Properties of Ti^{4+}-Ureasil Organic-Inorganic Hybrids

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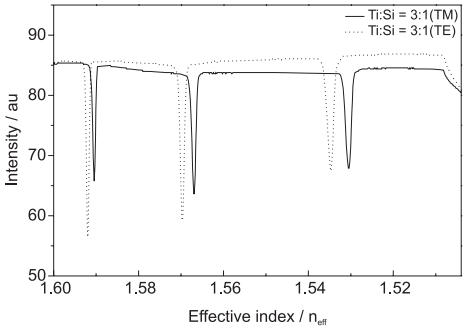

Figure 1S. Typical output of the prism couples apparatus.

The above figure is a typical output of the prism coupler apparatus. It gives the guided modes for one of the organic-inorganic thin films studied in this paper as a function of the effective index.

The effective index n_{eff} is given by

$$n_{eff} = \frac{\beta_m}{\vec{k}} \quad (1)$$

where k is the wavevector of the incident light and β_m is the propagation constant, of the mode m, given by

$$\beta_m = nk\sin\theta \quad (2)$$

i.e., it is the projection of the radiation wavevector along the propagation direction.

From a set of effective indexes a continuous effective-index function is defined by Chiang.[1] That function is then used to construct a refractive index profile by numerically solving the equation proposed in the inverse Wentzel-Kramers-Brillouin method.[1] This approach is used by the Metricon apparatus with the algorithm defined by Chiang.[1] Figure 6 of the paper is obtained in this way.

Figure 7 of the paper shows the calculated electric field confinement in the waveguide and also the evanescent field in the clading (substrate and air). It is calculated with a home-made software written by the authors, with data obtained from m-lines measurement. Basic formulae can be found in standard bibliography for waveguides.[2] The software is available from the authors under request.

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2. Marcuse, D.; *Theory of Dielectric Optical Waveguides*, 2nd ed., Academic Press, 1991.

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