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Structural symmetry breaking of silicon containing polymers and their relation with electrical conductivity and Raman active vibrations ALEJANDRO CABRERA, CARMEN GONZÁLEZ , LUIS TAGLE, CLAUDIO TERRAZA, ULRICH VOLKMANN, Pontificia Universidad Catolica de Chile, ANDRÉS BARRIGA, Universidad de Chile, ESTEBAN RAMOS, MAXIMILIANO PAVEZ, Pontificia Universidad Catolica de Chile — The incorporation of silicon into the polymeric main chain or side groups can provide an enhancement in chemical, physical and mechanical properties. We report an efficient method for the synthesis of polymers containing silicon in the main chain, from the polycondensation reactions of four optically active carboxylic diacid. The solubility of the polymers, the molecular weight, the glass transition and the thermal stability were studied by standard techniques. Raman spectroscopy was used to probe the conformation of stretching modes as function of the temperature. The conductivity measurements indicated that the alignment of the molecules is a crucial parameter for electrical performance. When the polymers were exposed to iodine, charge transfer increased their mobility and decreased their optical band gaps. These novel properties highlight the possibility to generate alternative active opto-electronics polymers.

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