Determination of Force Constants of Planar XY_3 and Tetrahedral XY_4 Molecules by the GF Matrix Method

Vesile Güçlü and Fatih Ucun

Department of Physics, Faculty of Arts and Sciences, Suleyman Demirel University, Isparta, Turkey

Reprint requests to Dr. F. U.; Fax: +90-246-2371106; E-mail: fucun@fef.sdu.edu.tr

Z. Naturforsch. **60a,** 183 – 186 (2005); received November 2, 2004

The force constants of the internal coordinates of planar XY_3 and tetrahedral XY_4 molecules were calculated using the GF matrix method. The matrix solutions were carried out by means of a computer program built relative to the Newton-Raphson method, and the calculations were listed in tables. For tetrahedral XY_4 molecules having the same Y atom it was found that the force constants decrease with the increasing mass of the X atom, and this was attributed to the slowing of the molecule with increasing mass of the centre X atom.

Key words: GF Matrix Method; Force Constants; XY_3 Molecules; XY_4 Molecules.