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Etching of GeSe in an inductively coupled SF6 plasma MEYER THIBAUT, AURELIE GIRARD, CHRISTOPHE CARDINAUD, Institut des Materiaux Jean Rouxel, Universite de Nantes, CNRS, France, EMELINE BAUDET, PETR NEMEC, Department of Graphic Arts and Photophysics, University of Pardubice, Czech Republic, VIRGINIE NAZABAL, UMR-CNRS 6226, Sciences Chimiques de Rennes, Universite de Rennes 1, France — This study is focused on Ge-Se glasses that are the fundamental part of more complex ternary chalcogenides as Ge-Sb-Se, Ge-As-Se. An Inductively Coupled Plasma (ICP) reactor allows to control independently the plasma density and the substrate bias. Plasma diagnostics such as optical emission spectroscopy, mass spectrometry and electrostatics probes are performed during the GeSe etching. These measurements provide some understanding about the volatile products, which are SeF_4, SeF_6, GeF_2, and GeF_4, by monitoring neutrals and ions intensities. The interaction between volatile products and SF_6 plasma are directly explained by the variation of plasma parameters measured by the Langmuir probe. Direct parameters such as the source power (700 and 1000 W), the pressure (3 mTorr to 30 mTorr), the flow rate (10 to 40 sccm) and the bias (0 to -150 V) are investigated. Substrate temperature is maintained at 20 C. Indirect parameters such as the ionic density or the atomic fluorine concentration are investigated by mixing SF_6, respectively with Ar or O_2. In situ X-ray Photoelectron Spectroscopy gives information on composition variation or the oxide formation regarding the etching conditions. Some results will be compared with the etching of Ge-Sb-Se glasses.

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