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Spectrometric analysis and kinetic modelling of an O_2-N_2 discharge CHANEL HAYDEN, DEREK MONAHAN, MILES M. TURNER, ANDREY ISLYAIKIN, ALBERT R. ELLINGBOE, Dublin City University, Ireland — Low pressure O_2-N_2 plasmas are widely used in a number of industrial processes such as surface treatment, cleaning and polymer etching. In this paper we will present an experimental analysis of an ashing discharge via mass spectrometry and optical emission spectrometry. The equipment under analysis comprises of an upstream microwave-rf downstream configuration at an operating pressure of 850 mT. Diagnostics were applied to the downstream chamber and a number of measurements taken for a range of microwave-rf power values and varying gas fractions. Resultant neutral species present in the discharge (N, O, NO, N_2O, NO_2) were analysed throughout this range of physical conditions. A general global model, currently under development, was used to simulate the experiment by means of a complex chemistry data set. It was found that the model was very sensitive to chemistry inputs, as such resulting outputs may well be deemed unreliable. Further investigation of the reliability of chemistry sets through validation by experimental assessment is central to the relevance of data obtained from global models.

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