

Temperature Measurements of Corona Discharge in the SF₆-N₂ Gas Mixture

Authors : A. Lemzadmi

Abstract : Rotational and vibrational temperatures of the SF₆-N₂ gas mixture are spectroscopically measured over a pressure range of 2-14 bars. The spectra obtained of the light emission of the corona discharge were recorded with different values of pressure, voltage and current together with the variation of the position of the tip electrode. The emission of N₂ is very dominant for different gas concentration and the second positive system 2S⁺ is the most important. The convolution method is used for the determination of the temperature. The Rotational temperature measurements of the plasma reveal gas temperatures in the range of 450-650°K and vibrational temperatures in the range of 1800-2200°K.

Keywords : rotational temperatures, corona discharges, SF₆-N₂ gas mixture, vibrational temperatures

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