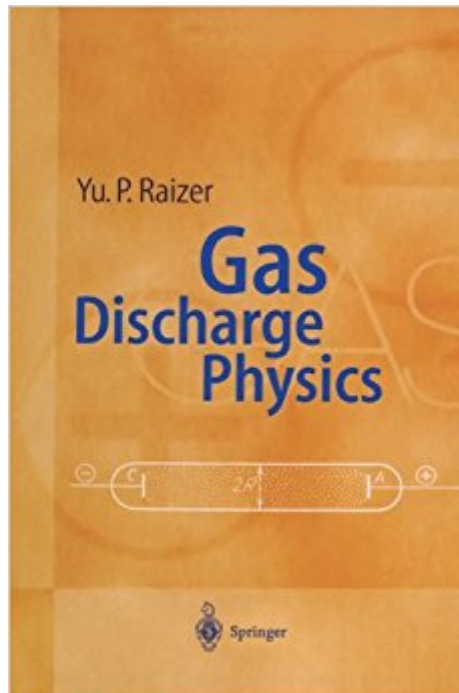




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Gas Discharge Physics



Synopsis

Here is both a textbook for beginners and a handbook for specialists in plasma physics and gaseous electronics. The book contains much useful data: results of experiments and calculations, and reference data. It provides estimates of typical parameters and formulas in forms suitable for computations. Gas discharges of all important types are discussed: breakdown, glow, arc, spark and corona at radio frequency, microwave and optical frequencies. The generation of plasma, and its application to high power gas lasers are treated in detail.

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Gas Discharge Physics Here is both a textbook for beginners and a handbook for specialists in plasma physics and gaseous electronics. The book contains much useful data: results of experiments and calculations, and reference data. It provides estimates of typical parameters and formulas in forms suitable for computations. Gas discharges of all important types are discussed: breakdown, glow, arc, spark and corona at radio frequency, microwave and optical frequencies. The generation of plasma electrons at electrostatic and electromagnetic fields, low- temperature plasma generation, and applications to high- power gas lasers are treated in detail.

This text was used in my graduate electrical engineering course on gas breakdown physics offered at my school (a major U.S. technical university). The fundamentals of electron / ion generation in various electric field configurations and pressure conditions are covered in analytical detail,

including all of the essential breakdown mechanisms which have been studied in literature. Also included is a great deal of experimental data useful for practical laboratory experiments with plasmas. The text is written at a level which should be useful for early graduate students in engineering or physics (beyond the level of F. Chen, Introduction to Plasma Physics), although it comes easier depending on the student's background in plasma physics, statistical mechanics, or circuit theory. This book covers essentially the same material as the much older text by E. Nasser (Fundamentals of Gaseous Ionization and Plasma Electronics), but is much cheaper (

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