PLASMA AND HIGH FREQUENCY PROCESSES FOR OBTAINING AND PROCESSING MATERIALS IN THE NUCLEAR FUEL CYCLE

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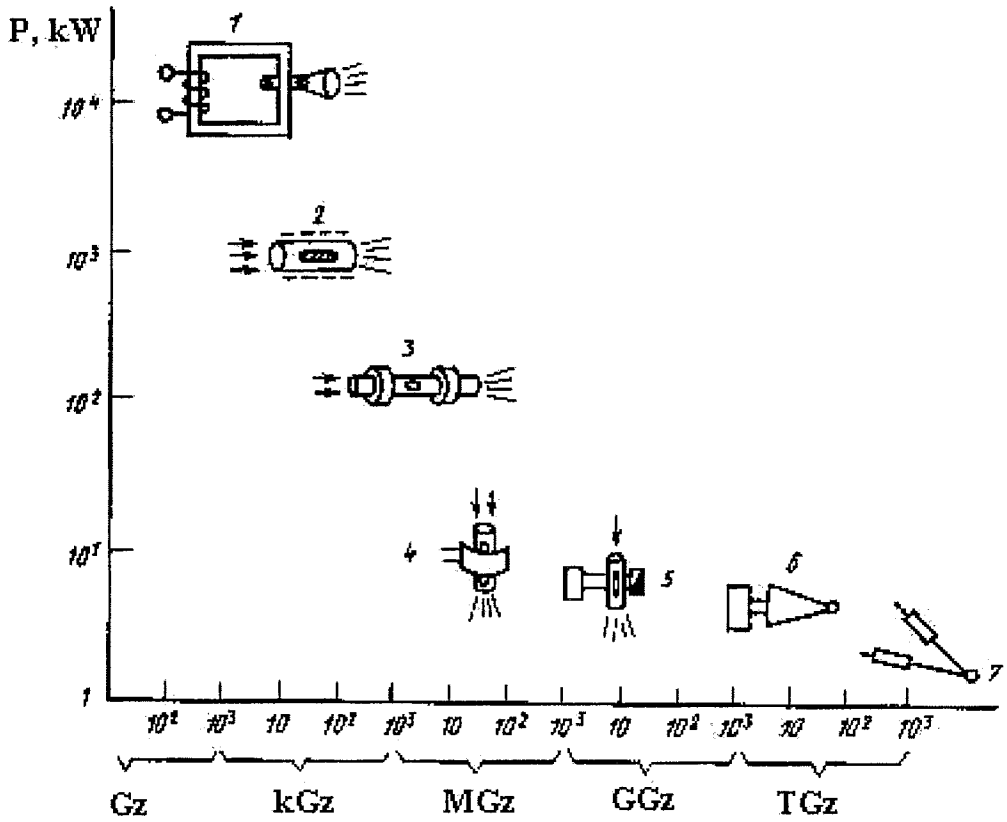

Fig. 2.38. Distribution of the frequency discharges n the frequency ranges of the electromagnetic spectra and the power levels to be specific for various discharges: 1 – transformer; 2 – high frequency inductive (HFI); 3 – high frequency capacitive (HFC); 4 – ultra short – wave (USW); 5 – microwave (MW); 6 – spatial microwave (SMW); 7 – laser.

2.12. Optical Discharges.

For generation of the optical discharges energy is fed into the plasma with the use of a laser beam concentrated at any location of the volume isolated from the environment by the appropriate casing or without it /16/. The scheme of the experiment for excitation of an optical discharge is shown in Fig. 2.39. The discharge burns in the focal point or close to it if the energy flux is enough for it. As the energy source, a CO_2 - laser was used generating radiation in the infrared range of the electromagnetic spectra. The absorption coefficient of the light radiation in plasma falls abruptly with raising frequency. Therefore the generation of the optical discharge in the visible light frequency range would require a power greater than that of CO_2 lasers by a factor of 10^2 - 10^3.

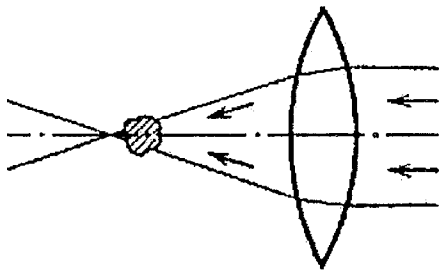

Fig. 2.39. Scheme of the experiment for sustaining continuous optical discharge: the plasma cluster is shifted somewhat from the focal point towards the laser beam source.