

References

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3.9 Radiation and temperature of a dense plasma column

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3.10 A solution-jet method for mass transport study

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Abstract

A new technique has been developed for mass transport study in d. c. arc plasma. Pulsed injection of examined element's aqueous solution is used in order to reduce the evaporation time to the time of substance's passing through the arc. Chopping of the liquid jet into small bullets enables relatively undisturbed burning of the arc.

Excitation of the substance, which evaporated in the arc, enables observations of its motion either by photomultiplier technique or high-speed camera method. Time resolution is achieved by an oscilloscope or time-base marker at the high-speed camera film, respectively. The advantages of the equipment lie in the determination of transport velocities, and residence time by different means.

3.11 Investigations of convection in d. c. arc

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Abstract

Time-resolved photomultiplier technique and high-speed camera method have been used for determination of convection velocities in the d. c. arc. The values of convection velocity are taken as equal to those of electrode particles' motion. A component of general transport velocity,

due to convection, has been evaluated from experimental results, too. The calculations with general transport velocities, found experimentally from expansion of excited cloud of evaporated substance, gave the values of velocity components due to electric field and diffusion. The observed substance's injection has been pulsed, and at different places in the arc. Relative vertical position of anode and cathode were changed, too. The comparison of results with those of other authors is given in the table.

DATA FROM:	$v_{\text{conv.}}$ (m/s)	$v_{\text{dif.}}$ (m/s)		$v_{\text{el.}}$ (m/s)		τ (ms)	
		Li	Na	Li	La	Li	Na
our results:	1.22—1.98	3.5(3)	3.4	2.2 (2,35)	1.5	4.6 (—) 7.34 (+)	2.02 (—) 3.52 (+)
Goldfarb, Vainboim:	1.4 ± 0.2				2.6 ± 0.5		
Goldfarb, Ilina:	2				50		
Suits:	1.2—0						
V. Stekelenburg:	1.5—2						
Hagenah:	2.05—0						
Bril:	1.89—4.19						
Goldfarb, Ilina:	0.7					² (1.4—2.7)	³ (2.2—3.9)
Raihbaum, Malyh:						1 (1.4)	
Malyh, Serd:						1.2	1.7

3.12 The influence of lithium on the change of spectral line intensity in the inhomogeneous magnetic field

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Abstract

The influence of lithium, i. e. Li_2CO_3 , on spectral line amplification in the external inhomogeneous magnetic field has been investigated.

Three types of the ratio of the spectral line intensities have been considered

$$A_1 = I_1/I_0, \quad A_2 = L_{L1}/I_0, \quad A_3 = I_1/I_{L1}.$$