

研究論文

磁気駆動回転アークによる気体加熱の研究

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Gas Heating Using Rotating Arc Driven by DC Magnetic Field

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Experimental study was conducted to heat gases using an arc driven by external magnetic field. DC arc was produced between a tungsten rod cathode and a cylindrical anode. DC electric current through a solenoid coil around a heating chamber induced the axial magnetic field which interacted with the arc. The anode root of the arc rotated on the cylindrical anode by the electromagnetic force. Experimental observation revealed that the movement of the rotating arc was unstable and its rotating frequency was uncertain. The arc voltage increased with the increase of the magnetic field strength. Gas temperature was measured by a specially designed calorimeter. The gas temperature increased with the increase of the magnetic field strength. Heating efficiency of the arc was nearly 40[%].

*Key Words* : Transferred arc, Gas heating, Magnetic field, Heating efficiency, Nitrogen