SPECTROSCOPIC MEASUREMENT OF Ag BREAK ARC

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ABSTRACT

The authors have studied maintaining mechanism of the contact arc discharge. For this object, the spectroscopic measurement system was composed using two monochromators and a bifurcated image fiber. Arc voltage waveform, arc current waveform, AgII(243.78nm) spectrum intensity, and AgI(328.07nm) spectrum intensity are measured for Ag break arc, under the condition where source voltage E= 6~48V, load inductance L= 0~2.3mH , and closed contact current I_o= 0.6~6A. Spectrum intensity of AgII(ion line) becomes maximum value near the gaseous phase transition point, and it gradually decreases in the gaseous phase. The spectrum intensity of AgI(excited atom line) increases until gaseous phase transition point. After the gaseous phase transition, AgI becomes constant value (40~50) which does not depend on the circuit condition. Furthermore, in the boundary closed current at which transition ratio is 50%, it is clarified that the average spectrum intensity of AgII has constant value without depending on the circuit condition. Therefore, transition to gaseous phase is made when the mean number of Ag ion exceeds certain value.

Key Words: electrical contact, Ag, breaking arc, spectroscopic measurement, gaseous phase, metallic phase