

Abstract Submitted
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Modification of Richardson-Dushman Equation, variation of thermionic emission constants, temperature variation of workfunction in metals DILIP DE, Kaduna State University, Kaduna State, Kaduna, Nigeria, MATHIAS AJAEROH IKECHUKWU, Department of Physics, University of Abuja, Abuja, Nigeria — For proper modeling of the thermionic converters and evaluation of efficiency and power output (from given input energy flux) it is necessary to estimate accurately the thermionic currents from the hot emitter surface. In this paper we derive the expression for the work function of a metal as a function of temperature considering thermal expansion and constant number of free electrons. We then modify the Richardson-Dushman equation for thermionic emission and explain the variation of the Thermionic emission constant from metal to metal. This theory of modification of Richardson-Dushman thermionic equation is quite different from that of Seely (1941) and explains better the observed temperature rate of change of work function of tungsten and the variation of thermionic emission constants from metal to metal.

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