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A generalized Sommerfeld expansion for thermopower calculation
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— Kelvin formula relates the thermopower to the temperature derivative of the chemical potential. The latter can be evaluated using the Sommerfeld expansion as a standard approximation at low temperatures. We present a generalized expansion with improved accuracy at intermediate and high temperatures. We apply the formula to sodium cobaltate NaxCoO2 and other thermoelectric materials to verify its validity over a wide temperature range.

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