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LETTER

Letter to the Editor

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The recent paper by Cai and Liu [1] developed a new integral method of nonisothermal kinetic analysis involving the *general temperature integral* defined by

$$\left(\frac{E}{R}\right)^{m+1} \int_{E/(RT)}^{\infty} x^{-m-2} \exp(-x)\, dx. \tag{1}$$

The paper stated that (1) does not have an "exact analytical solution" and went on to develop an approximation. Here, I would like to point out (1) does have an exact analytical solution. In fact, (1) is equal to

$$\left(\frac{E}{R}\right)^{m+1} \Gamma\left(-m-1, \frac{E}{RT}\right),$$

where $\Gamma(\cdot, \cdot)$ is the *incomplete gamma function* defined by

$$\Gamma(a, x) = \int_{x}^{\infty} t^{a-1} \exp(-t)\, dt. \tag{2}$$

The incomplete gamma function in (2) is well known and well established in the mathematics literature, see Sect. 8.35 of [2] for detailed properties. In-built routines for the computation of the incomplete gamma function are available in every major computer package, including Maple and Mathematica. Thus, the need for approximations for (1) can be avoided.

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References

1. J. Cai, R. Liu, Dependence of the frequency factor on the temperature: a new integral method of nonisothermal kinetic analysis. J. Math. Chem. (2007) (in press)
2. I.S. Gradshteyn, I.M. Ryzhik, *Table of Integrals, Series, and Products*, 6th edn. (Academic Press, San Diego, CA, 2000)