***Supplementary information to:***

Cure Kinetics of Samarium-doped Fe3O4/Epoxy Nanocomposites

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***Friedman model***

By plotting  *vs*. 1/T*α* from Eq. (S1), the value of *Eα* is obtained from the slope of Figure S1.

|  |  |
| --- | --- |
| , | (S1) |



**Figure S1.** Arraysof*ln(dα/dt)* plots *vs.* 1/T as typical plots obtained for the studied samples using Friedman model at *β*= 2.5 ˚C/min.

***KAS method***

Plotting  *vs*. 1/*Tα* from Eq. (S2) for each α value gives a value for the *Eα* (Figure S2).

|  |  |
| --- | --- |
| , | (S2) |



**Figure S2.** Arraysof ln(β/T2) plots vs. 1/T as typical plots obtained for the studied samples using *KAS* model.

***Friedman model***

This method can be applied on experimental data using Eq. (S3). The shape of the plot of *ln*[*Af(α)*] *vs.* *ln*(1-*α*) can be used to determine whether or not the cure reaction has roots in autocatalytic reaction mechanism (Figure S3).

|  |  |
| --- | --- |
| , | (S3) |



**Figure S3.** Arraysof*ln [Af(α)]* plots vs. *ln(1-α)* as typical plots obtained for the studied samples using *Friedman* model.

A more accurate *Malek* method was also used for determination of kinetic model by considering the maximum points of Malek parameters of *y(α) = (αm), z(α) = (αp∞)* which are defined in equations S2 and S3 respectively, and the conversion at the maximum point of DSC curves (*αp*).

|  |  |
| --- | --- |
| , | (S4) |
| , | (S5) |

The values of the *y(α)* and *z(α)* are normalized with respect to their maximum values to take values between 0 and 1 (see Figure S4).



**Figure S4.** The shape and alteration pattern of *y(α)* and *Z(α)* versus the extent of reaction captured by the Malek model.

A set of equations (S4 and S5) should be solved simultaneously to explore the triplet parameters of cure, i.e. (*n*, *m*, ln *A*) s:

|  |  |
| --- | --- |
| , | (S6) |
| , | (S7) |



**Figure S5.** Variation of Value I of the samples prepared in this work at typical heating rate of 2.5 °C/min



**Figure S6.** Variation of Value II of the samples prepared in this work at typical heating rate of 2.5 °C/min