Electronic Supplementary Material (ESI) for RSC Advances. This journal is © The Royal Society of Chemistry 2017

## **Supplementary Information**

Tailoring performance of magnetorheological elastomers containing Fe<sub>2</sub>O<sub>3</sub> decorated carbon nanofiber

Dongju Lee<sup>‡a</sup> O-Seok Kwon<sup>‡b</sup> and Sung Ho Song<sup>c,\*</sup>

<sup>a</sup>Nuclear Materials Development Division, Korea Atomic Energy Research Institute, 989-111 Daedeok-daero, Yuseong-gu, Daejeon, 34057, Republic of Korea

<sup>b</sup> NEXEN Tire Corporation R&D Center, 30, Yusan-Dong, Yangsan-Si, Kyungnam, Korea 626-230

<sup>b</sup>Division of Advanced Materials Engineering, Kongju National University, Chungnam 330-717, Republic of Korea

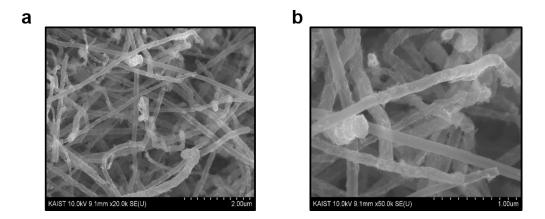


Fig. S1. SEM images of CNF-Fe<sub>2</sub>O<sub>3</sub>

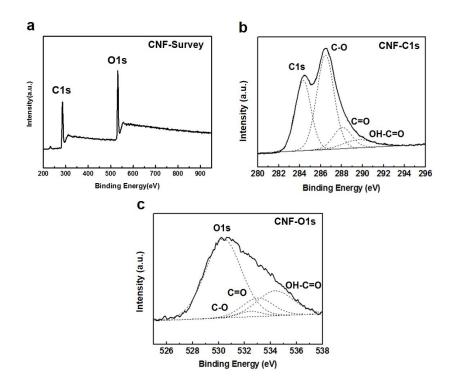


Fig. S2. High resolution XPS spectra of the acid treated CNF

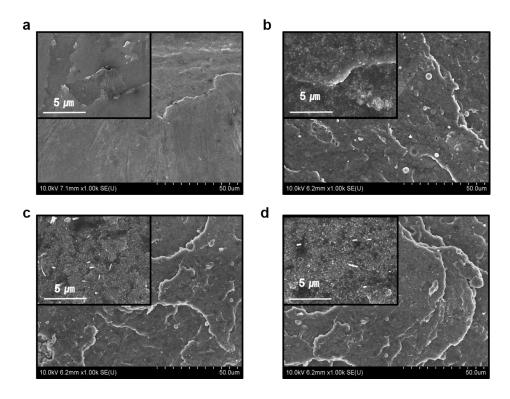


Fig. S3. SEM images of the fracture surfaces of the SBR composites.

Table S1. Formation of elastomer nanocomposites

| STEP   | Materials       | Control | Fe2O3<br>5 phr | CNF<br>5 phr | CNF-Fe2O3<br>5 phr |
|--------|-----------------|---------|----------------|--------------|--------------------|
| STEP 1 | SBR Latex       | 20      | 20             | 20           | 20                 |
|        | Fe2O3           | -       | 5              | -            | -                  |
|        | CNF             | -       | -              | 5            | -                  |
|        | CNF-Fe2O3       | -       | -              | -            | 5                  |
| STEP 2 | SBR             | 80      | 80             | 80           | 80                 |
|        | Carbon<br>Black | 50      | 50             | 50           | 50                 |
|        | Stearic Acid    | 1       | 1              | 1            | 1                  |
|        | Sulfur          | 1.75    | 1.75           | 1.75         | 1.75               |
|        | TBBS            | 1       | 1              | 1            | 1                  |