Supporting Information

for

Wet chemistry route for the decoration of carbon nanotubes with iron oxide nanoparticles for gas sensing
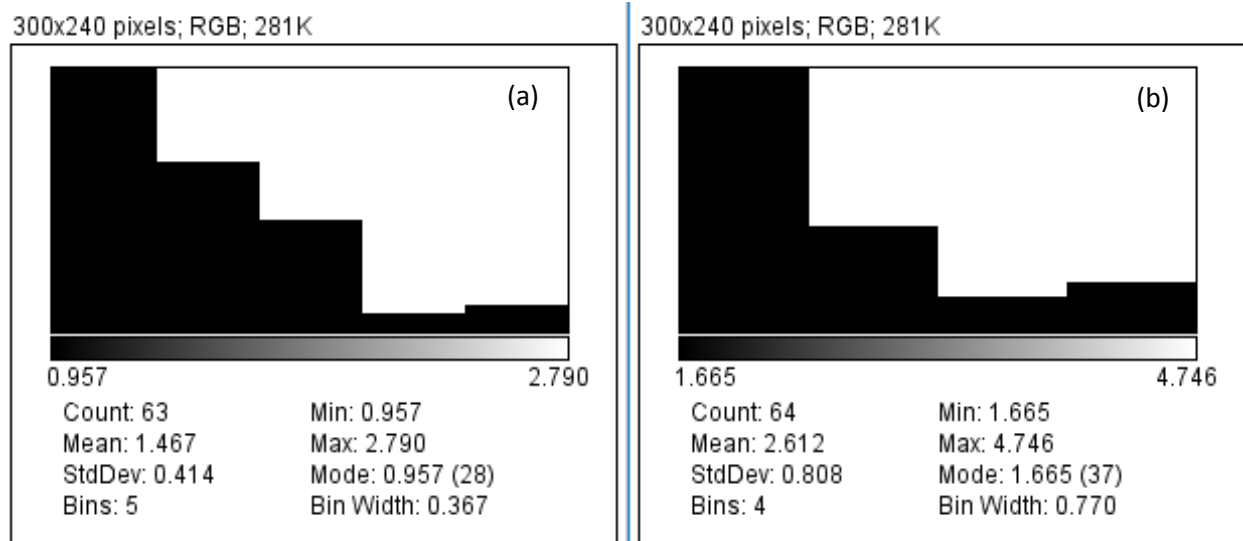
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Nanoparticle size distribution histograms

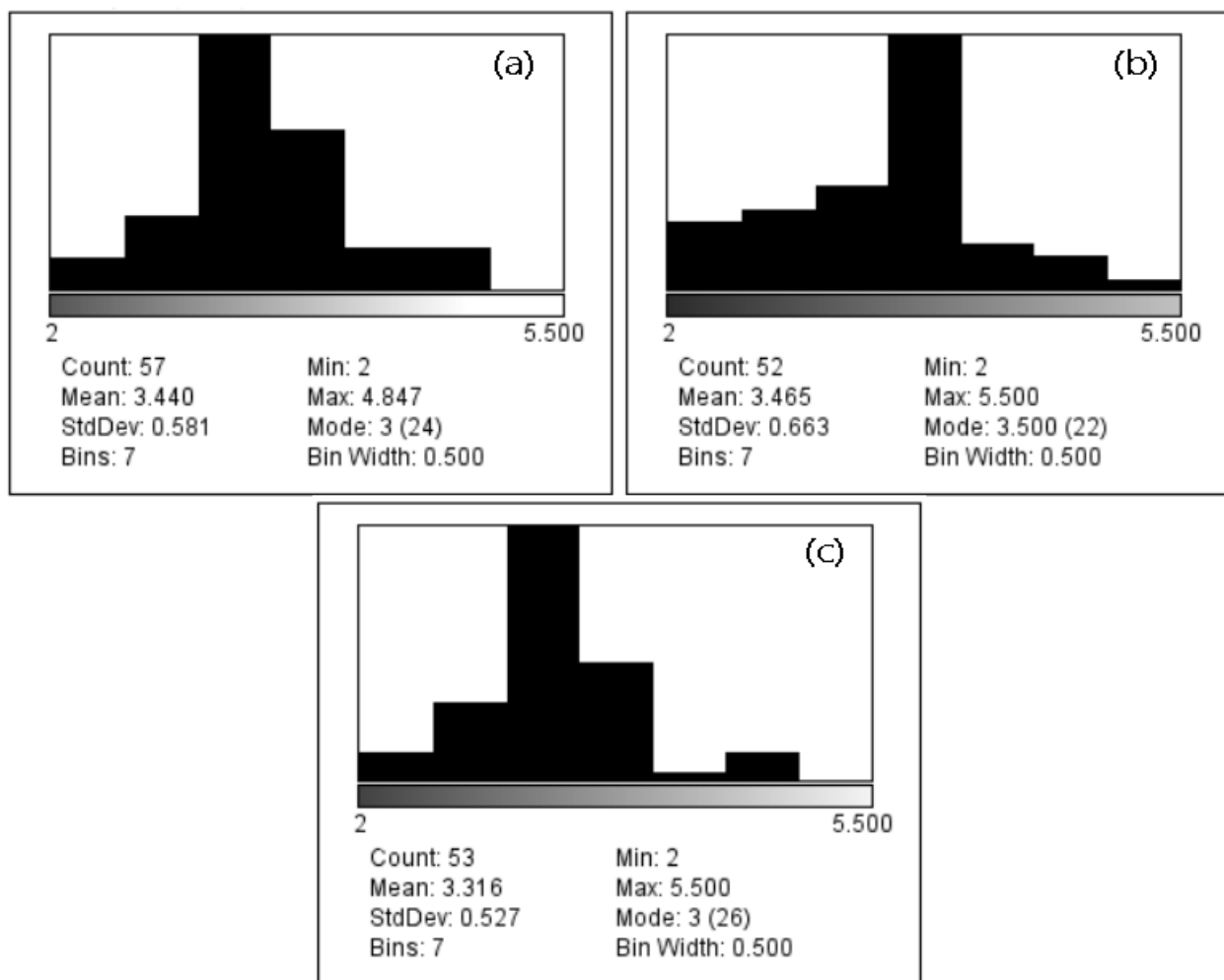# 1. Effect of calcination period on nanocluster size

Figure S5 shows a chart of the different size distribution for two samples of the same decoration ratio of (CNT/Fe = 1:1.5) but with different calcination periods as TEM images, shown in Figure 9a of experimental part from the work, were analyzed using ImageJ software and sizes of different number of particles were measured then the average size was calculated.

300x240 pixels; RGB; 281K

(a)

0.957   2.790

Count: 63	Min: 0.957
Mean: 1.467	Max: 2.790
StdDev: 0.414	Mode: 0.957 (28)
Bins: 5	Bin Width: 0.367

300x240 pixels; RGB; 281K

(b)

1.665   4.746

Count: 64	Min: 1.665
Mean: 2.612	Max: 4.746
StdDev: 0.808	Mode: 1.665 (37)
Bins: 4	Bin Width: 0.770

Figure S5: Nanocluster size distribution in case of 15 minutes calcination (a) and 30 minutes calcination (b).

2. Effect of decoration ratio on nanocluster size

Figure S6 shows a chart of the size distribution for three samples with the same calcination time (30 minutes) but for decoration ratios of (CNT/Fe = 1:1, 1:1.3 and 1:1.5). As TEM images, shown in Figure 3 of experimental part from the work, were analyzed using ImageJ software and sizes of different number of particles were measured then the average size was calculated to determine the effect of decoration ratio on the nanocluster size.

(a)

| 2 | 5.500 |

Count: 57   Min: 2
Mean: 3.440   Max: 4.847
StdDev: 0.581   Mode: 3 (24)
Bins: 7   Bin Width: 0.500

(b)

| 2 | 5.500 |

Count: 52   Min: 2
Mean: 3.465   Max: 5.500
StdDev: 0.663   Mode: 3.500 (22)
Bins: 7   Bin Width: 0.500

(c)

| 2 | 5.500 |

Count: 53   Min: 2
Mean: 3.316   Max: 5.500
StdDev: 0.527   Mode: 3 (26)
Bins: 7   Bin Width: 0.500

Figure S6: Nanocluster size distribution in case of 30 minutes calcination for decoration ratio of 1:1(a), decoration ratio of 1:1.3(b) and decoration ratio of 1:1.5 (c).