**Polymeric smart coatings containing modified capped Halloysite nanotubes for corrosion protection of carbon steel**

Sehrish Habib1,2, Adnan Khan3, Salman M. Ismail4, R. A Shakoor1,2\*, Ramazan Kahraman5,\*, Elsadig Mahdi Ahmed2

1Center for Advanced Materials (CAM), Qatar University, 2713 Doha, Qatar.

2Department of Mechanical and Industrial Engineering, Qatar University, 2713 Doha, Qatar

3Department of Materials Science and Engineering, Texas A&M University, College Station, 77843 TX, USA.

4Community College of Qatar, Qatar

5Department of Chemical Engineering, Qatar University, 2713 Doha, Qatar.

**Table S1.** The electrochemical impedance data values achieved for the blank Epoxy and the epoxy modified with capped HNTs immersed in 3.5 wt % NaCl at different immersion times at 25 °C.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Coatings | Time  (days) | *R*pore  (Ω.cm2) | CPE1  (sn Ω−1cm−2) | n1 | *R*ct  (Ω.cm2) | CPE2  (sn Ω−1 cm−2) | n2 | *Rs*  (Ohms) | *W*  (sn Ω−1 cm−2) | Goodness of fit |
| Blank Epoxy coatings | 1  5  10  15  20 | 5.03 x 106  3.10 x 106  2.57 x 106  8.57 x 105  1.27 x 105 | 9.37 x 10-12  9.25 x 10-12  5.55 x 10-12  1.38 x 10-12  1.35 x 10-12 | 0.84  0.82  0.76  0.64  0.53 | 7.38 x 106  6.60 x 106  1.71 x 106  5.66 x 105  1.67 x 105 | 9.45 x 10-9  8.43 x 10-9  8.06 x 10-9  7.99 x 10-9  1.54 x 10-9 | 0.86  0.83  0.75  0.70  0.67 | 760.5  720.0  726.4  680.5  681.9 | -  -  -  -  - | 4.88 x 10-3  2.94 x 10-3  1.53 x 10-3  1.03 x 10-3  5.27 x 10-3 |
| Capped HNTs/epoxy  coatings | 1  5  10  15  20 | 7.50 x 107  1.28 x 107  1. 96 x 107  1.04 x 108  6.51 x 108 | 8.05 x 10-12  5.52 x 10-12  7.57 x 10-12  8.55 x 10-12  9.76 x 10-12 | 0.80  0.75  0.74  0.66  0.52 | 9.57 x 107  8.97 x 107  9.50 x 107  5.12 x 108  13.66 x 108 | 8.61 x 10-9  5.80 x 10-9  7.61 x 10-9  8.53 x 10-9  9.82 x 10-9 | 0.82  0.80  0.76  0.74  0.64 | 769.0  727.9  723.7  730.7  717.4 | 18.7  24.2  22.3  18.9  14.3 | 1.60 x 10-3  8.16 x 10-3  2.12 x 10-3  8.26 x 10-3  1.91 x 10-3 |