Supplementary Material (ESI) for Journal of Materials Chemistry

End-Selective Functionalization of Carbon Nanotubes. Use of DOE for the Optimization of a DNA Probe Attachment and Hybridization Using an Enzymatic Amplifying System

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Electronic Supplementary Information (ESI)

Category Protocol N°	**Total Binding** (OD)	**Non-Specific Binding** (OD)	**EF** (n° 1)[a]	**Pegylated MWCNTs$_{ox}$: Total Binding** (OD)	**Pegylated MWCNTs$_{ox}$: Non-Specific Binding** (OD)	**EF** (n° 2)[b]
8	2.22	1.06	**1.1**	1.04	0.03	**32.8**
7	2.11	1.30	**0.6**	1.20	0.03	**48.0**
3	2.82	1.25	**1.3**	0.51	0.05	**9.5**
5	2.53	1.25	**1.0**	1.09	0.04	**27.5**
1	2.68	1.43	**0.9**	1.25	0.03	**37.0**
2	2.92	1.24	**1.4**	1.18	0.03	**36.9**
6	1.44	1.19	**0.2**	1.04	0.03	**33.0**
4	1.80	1.28	**0.4**	1.04	0.03	**33.0**
Stand. 9	3.30	2.38	**0.4**	1.33	0.04	**34.1**

Table ESI-1. OD and EF data for the 1st randomly executed set of DOE experiments involving *non-pegylated* ***(a, n° 1)*** and *pegylated* ***(b, n° 2)*** oxidized MWCNTs$_{ox}$

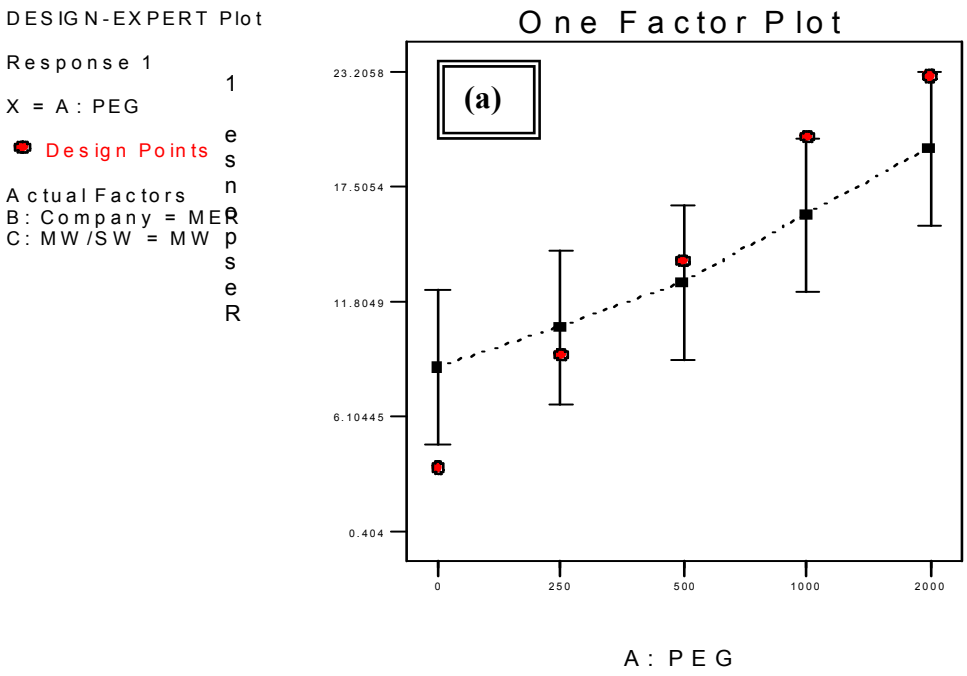


Figure ESI-1a (One Factor Plot Graph). Optimal conditions for the oxidative opening of MWCNTs and sidewall PEG-mediated passivation from DOE experiments (influence of the molecular weight of the PEG polymer)

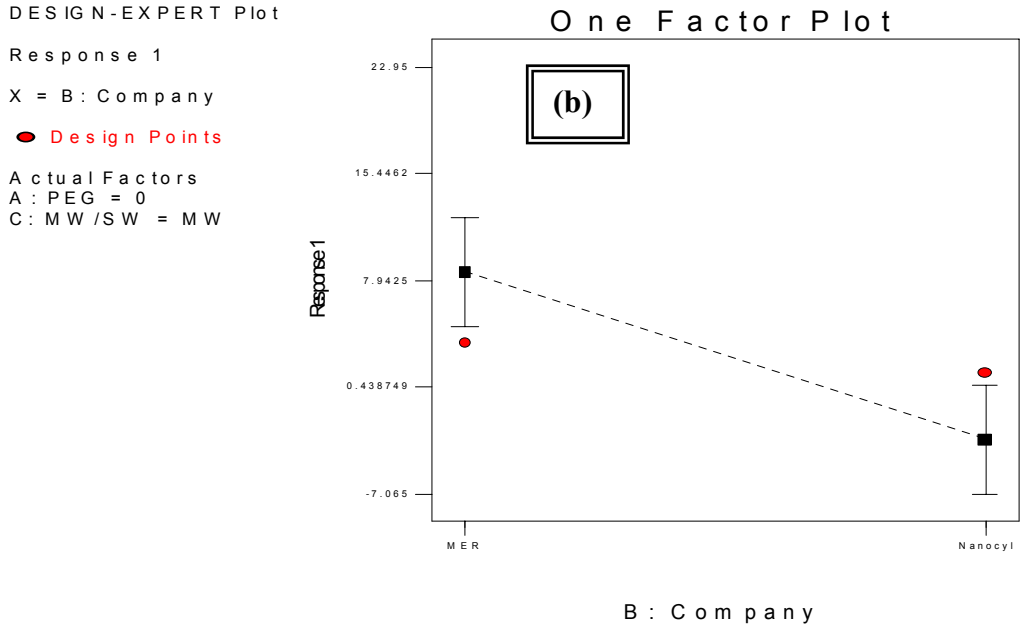


Figure ESI-2a (One Factor Plot Graph). Optimal conditions for the oxidative opening of MWCNTs and sidewall PEG-mediated passivation from DOE experiments (influence of the commercial source of MWCNTs/SWCNTs)

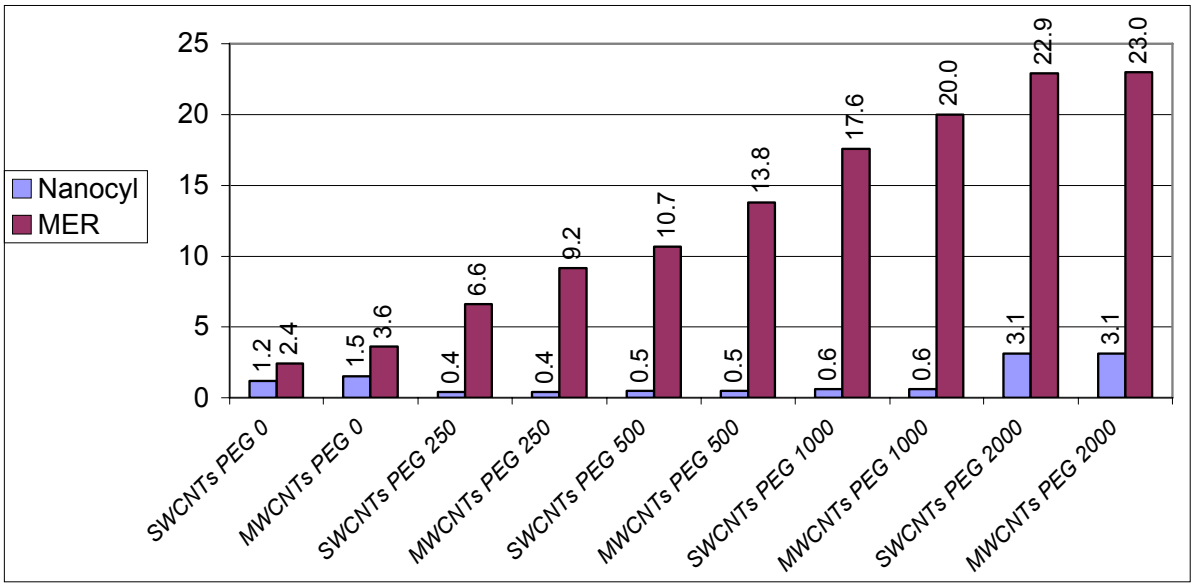


Figure ESI-2b. Influence of the commercial source of MWCNTs/SWCNTs (MER Corporation Ltd. and Nanocyl s.a.)

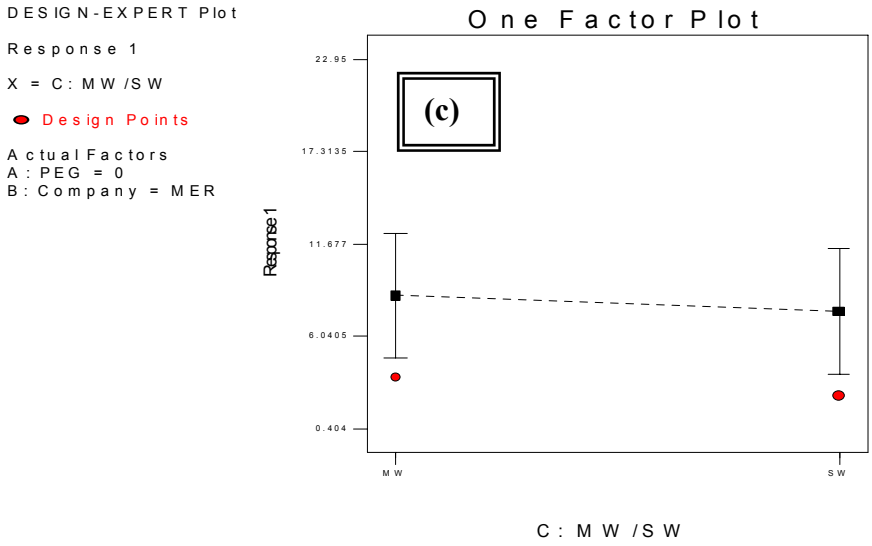


Figure ESI-3a (One Factor Plot Graph). Optimal conditions for the oxidative opening of MWCNTs and sidewall PEG-mediated passivation from DOE experiments (influence of the *multi*- or *single*-walled type of starting MWCNTs/SWCNTs)

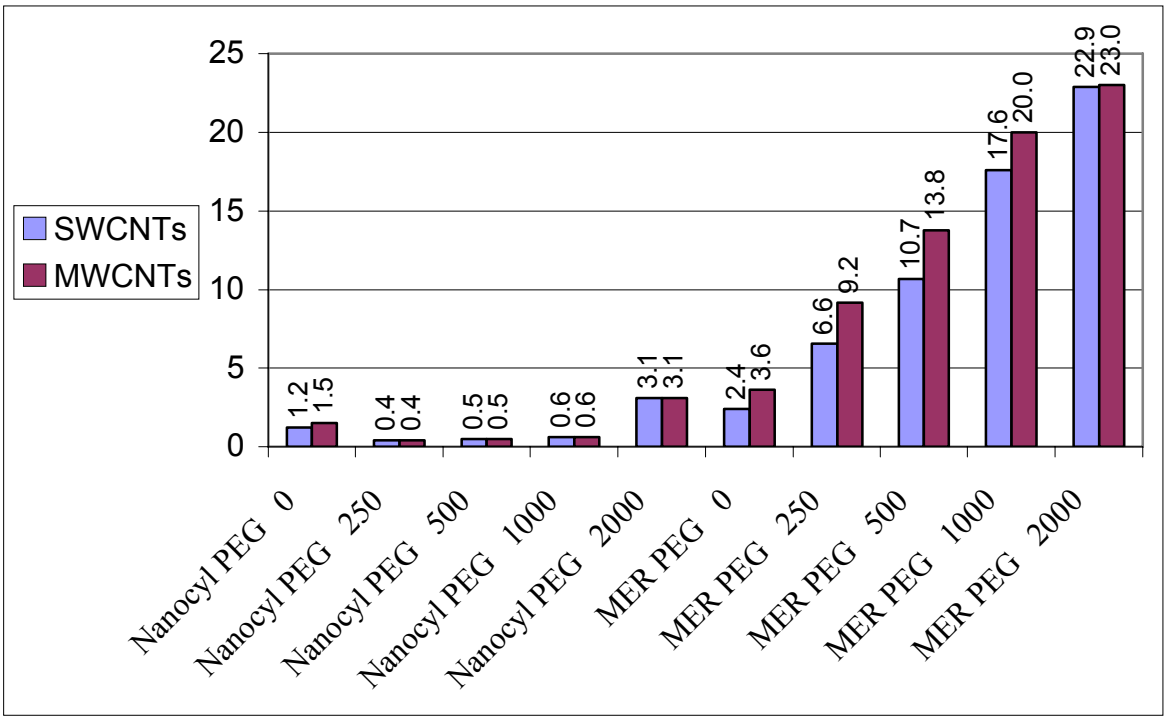


Figure ESI-3b. Influence of the *multi*- or *single*-walled type of starting MWCNTs/SWCNTs

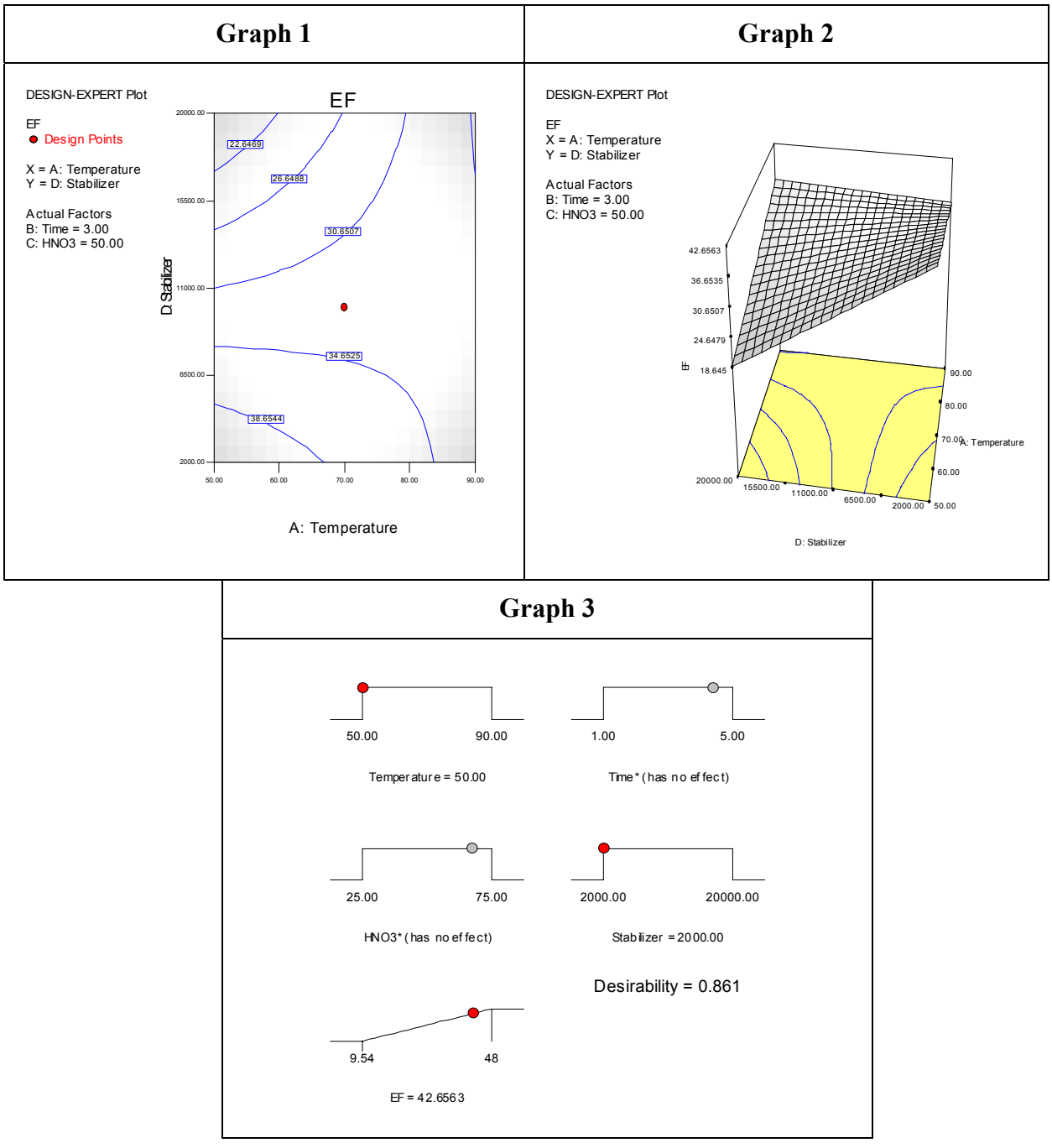
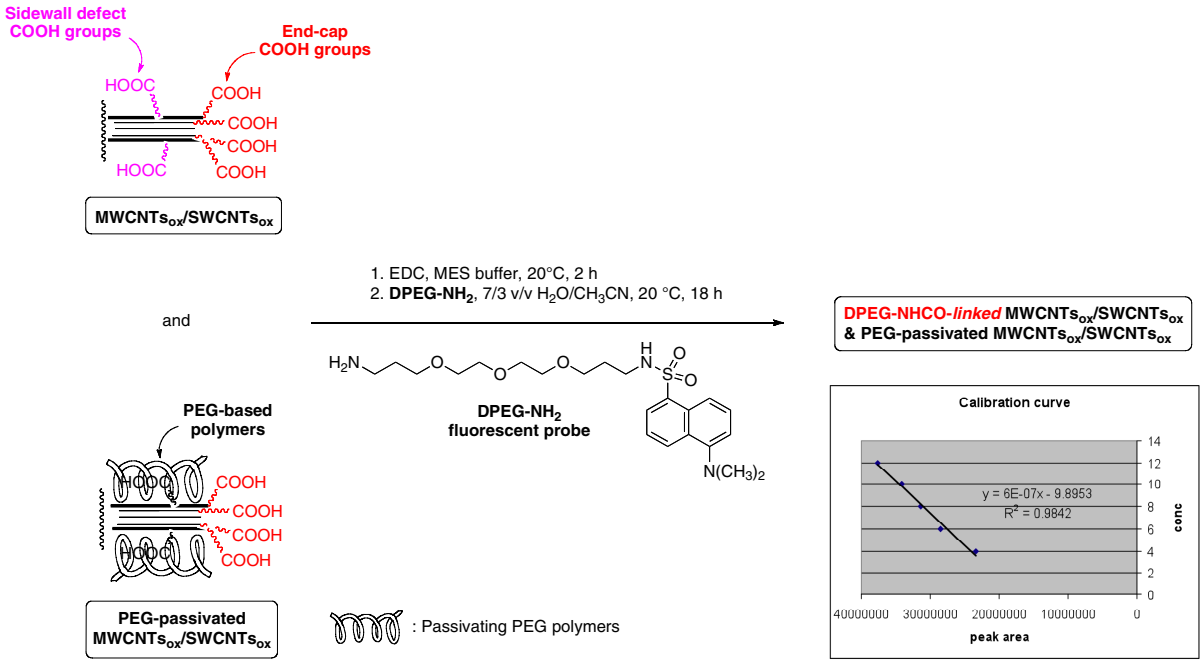


Figure ESI-4. Graphs 1-3: Sequence optimization and optimal conditions disclosed from a 1st set of DOE experiments using an HRP-amplifying DNA-based hybridization system



Scheme ESI-1. Quantification of accessible end- *versus* sidewall-localized COOH groups using the EDC-mediated covalent attachment of the fluorescent probe **DPEG-NH$_2$**