nanomaterials

MDPI

Supplementary Information

Insights into Metal Oxide and Zero-Valent Metal Nanocrystal Formation on Multiwalled Carbon Nanotube Surfaces during Sol-gel Process

Dipesh Das [1], Indu V. Sabaraya [1], Tara Sabo-Attwood [2] and Navid B. Saleh [1,*]

[1] Department of Civil, Architectural and Environmental Engineering, The University of Texas at Austin, Austin, TX 78712, USA; dipesh.das@utexas.edu (D.D.); indu.venu@utexas.edu (I.V.S.)
[2] Department of Environment and Global Health, University of Florida, Gainesville, FL 32610, USA; sabo@phhp.ufl.edu
* Correspondence: navid.saleh@utexas.edu; Tel.: +1 (512)-471-9175

Table S1. Standard Electrode potential of different metal species: Reactions and values[1]

[1]Vanysek, P., Electrochemical series. *CRC handbook of chemistry and physics* **1998,** *87*

NH	Reaction	Standard Electrode Potential (V)
MWNT-Al_2O_3	$Al^{3+} + 3e^- \leftrightarrow Al$ (s)	-1.662
MWNT-CeO_2	$Ce^{3+} + 3e^- \leftrightarrow Ce$ (s)	-2.336
MWNT-CoO_3	$Co^{2+} + 2e^- \leftrightarrow Co$ (s)	-0.28
MWNT-Cu_2O	$Cu^{2+} + 2e^- \leftrightarrow Cu$ (s)	+0.345
MWNT-Er_2O_3	$Er^{3+} + 3e^- \leftrightarrow Er$ (s)	-2.331
MWNT-Eu_2O_3	$Eu^{3+} + 3e^- \leftrightarrow Eu$ (s)	-1.991
MWNT-Fe_xO_y	$Fe^{2+} + 2e^- \leftrightarrow Fe$ (s)	-0.44
MWNT-HfO_2	$Hf^{4+} + 4e^- \leftrightarrow Hf$ (s)	-1.55
MWNT-MgO	$Mg^{2+} + 2e^- \leftrightarrow Mg$ (s)	-2.372
MWNT-MnO	$Mn^{2+} + 2e^- \leftrightarrow Mn$ (s)	-1.185
MWNT-MoO_2	$Mo^{3+} + 3e^- \leftrightarrow Mo$ (s)	-0.200
MWNT-NiO	$Ni^{2+} + 2e^- \leftrightarrow Ni$ (s)	-0.25
MWNT-Pr_6O_{11}	$Pr^{3+} + 3e^- \leftrightarrow Pr$ (s)	-2.353
MWNT-SiO_2	--	
MWNT-SnO_2	$Sn^{2+} + 2e^- \leftrightarrow Sn$ (s)	-0.1375
MWNT-TiO_2	$Ti^{2+} + 2e^- \leftrightarrow Ti$ (s)	-1.63
MWNT-V_xO_y	$V^{2+} + 2e^- \leftrightarrow Pr$ (s)	-1.13
MWNT-WO_3	$W^{3+} + 3e^- \leftrightarrow W$ (s)	+0.1
MWNT-ZnO	$Zn^{2+} + 2e^- \leftrightarrow Zn$ (s)	-0.7628
MWNT-ZrO_2	$Zr^{4+} + 4e^- \leftrightarrow Zr$ (s)	-1.45
MWNT-Ag	$Ag^+ + e^- \leftrightarrow Ag$ (s)	+0.7996
MWNT-Au	$Au^{3+} + 3e^- \leftrightarrow Au$ (s)	+1.498
MWNT-Pd	$Pd^{2+} + 2e^- \leftrightarrow Pd$ (s)	+0.951
MWNT-Pt	$Pt^{2+} + 3e^- \leftrightarrow Pt$ (s)	+1.18

Table S2 Atomic percentages and molar ratio of carbon: metal estimated from the XPS spectra using CasaXPS software.

Sample	%C	%Metal
MWNT-ZnO	78.5±1.0	6.2±0.5
MWNT-Ag	89.4±0.9	8.3±0.5
MWNT-Cu/Cu2O	79.2±1.2	5.2±0.4