Supporting information:

Phase composition before CNT oxidation		Precursors for sol-gel reaction	
1	γ-Al_2O_3	Aluminium nitrate	$Al(NO_3)_3$
2	SiO_2	Tetraethyl orthosilicate	$Si(OC_2H_5)_4$
3	β-ZrO_2	Zirconium-*n*-propoxide	$Zr(OC_3H_7)_3$
4	WO_3	Tungsten ethoxide	$W(OC_2H_5)_6$
5	ZnO	Zinc nitrate	$Zn(NO_3)_2.6H_2O$
6	Fe_2O_3	Iron nitrate	$Fe(NO_3)_3.9H_2O$
7	SnO_2	Tin chloride	$SnCl_2$
8	Cr_2O_3	Chromium (III) acetylacetonate	$Cr(acac)_3$
9	MgO	Magnesium nitrate	$Mg(NO_3)_2$
10	A-TiO_2	Tetrabutyl orthotitanate	$Ti(OC_4H_9)_4$
11	MoO_3	Molybdenum acetate	$Mo(OAc)_2$
12	CuO	Copper sulfate	$CuSO_4$
13	R-TiO_2	Tetrabutyl orthotitanate	$Ti(OC_4H_9)_4$
14	V_2O_5	Vanadyl *i*-propoxide	$VO(OC_3H_7)_3$
15	NiO	Nickel acetate	$Ni(OAc)_2$
16	La_2O_3	Lanthanum nitrate	$La(NO_3)_3$-$6H_2O$
17	Mn, Mn_2O_3	Manganese acetate	$Mn(OAc)_2$
18	CeO_2	Cerium (III) 2-ethylhexanoate	$Ce(C_8H_{15}O_2)_3$
19	Co_3O_4	Copper acetate	$Co(OAc)_2$
20	PbO	Lead (II) oxide	PbO
21	β–Bi_2O_3	Bismuth-2-hexylhexanoate	$Bi(C_{12}H_{23}O_2)_3$

Table S1: List of synthesised CNT-metal oxide hybrids including precursors for sol-gel reaction and phase composition before and after CNT oxidation.

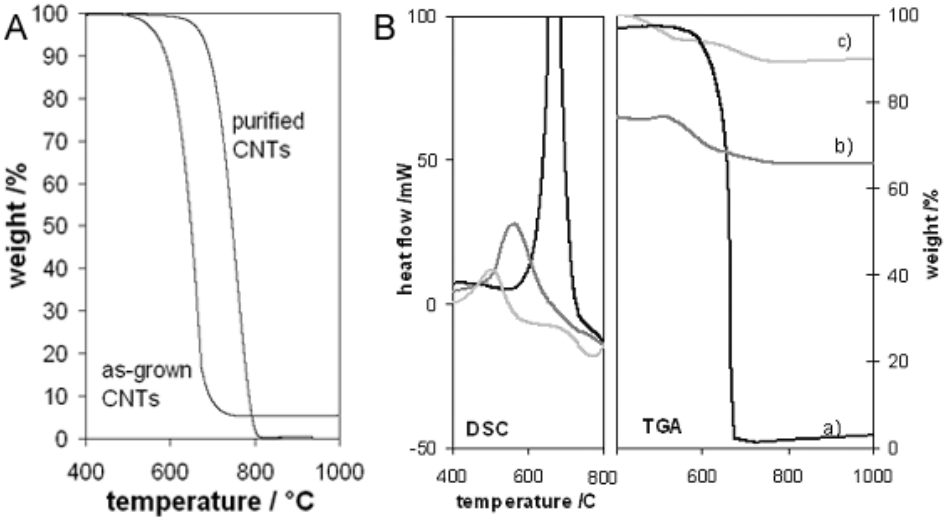

Figure S1: A) Weight loss curves for as-grown and purified CNTs showing a reduction in the residual weight from metal catalyst from 5 wt% to 0.5 wt% as well as an increased oxidation temperature due to the removal of amorphous carbon and metal residues. B) Combined weight loss and heat flow curves (TGA/DSC) for a) uncoated CNTs (as-grown) and CNTs coated with b) anatase-TiO_2 and c) rutile-TiO_2, modified from reference [8]. The results show that the oxidation temperatures for the CNT-TiO2 hybrids are reduced compared with the uncoated CNTs, in the order CNT-rutile < CNT-anatase < CNT.

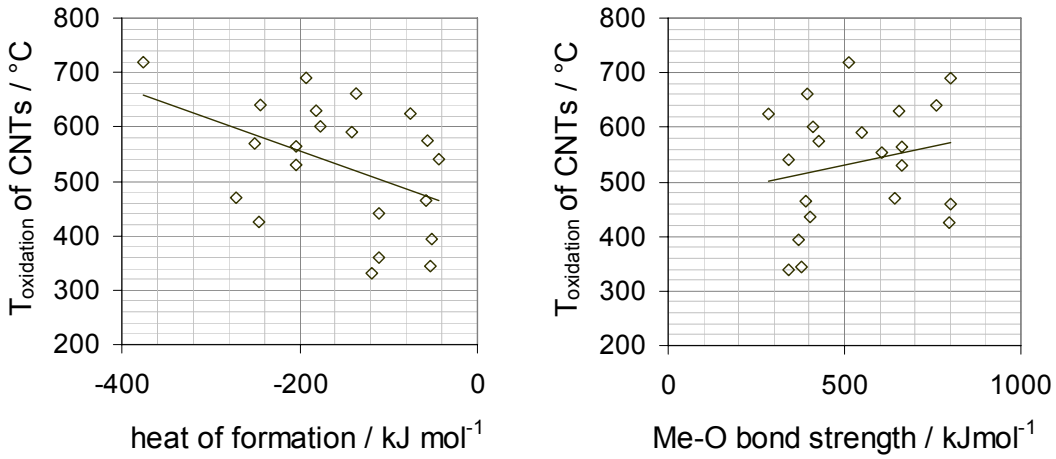

Figure S2: Relationships between the onset temperatures for CNT oxidation and literature data for (left) heat of formation of the metal oxides from lower oxides/metals and (right) metal-oxygen bond strength.

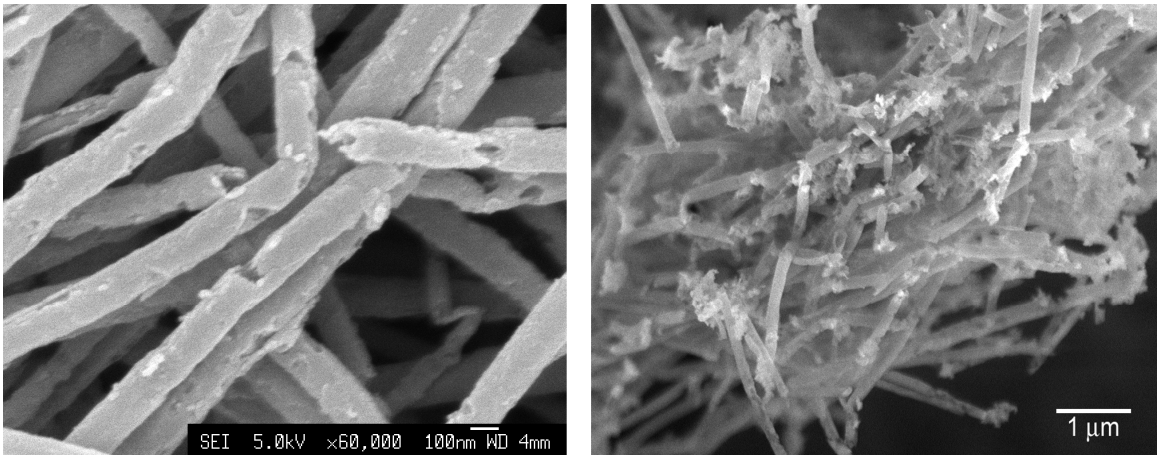

Figure S3: SEM images of CNT-WO_3 and CNT-ZrO_2 hybrids after a controlled careful oxidation of CNTs at temperatures a few degrees below T_{Ox}. The images show that the tubular structure of WO_3 and ZrO_2 is preserved.