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(54) Title: NANOTUBE DISPERSANTS AND DISPERSANT FREE NANOTUBE FILMS THEREFROM

(57) Abstract: A degradable polymeric nanotube (NT) dispersant comprises a multiplicity of NT associative groups that are connected to a polymer backbone by a linking group where there are cleavable groups within the polymer backbone and/or the linking groups such that on a directed change of conditions, bond breaking of the cleavable groups results in residues from the degradable polymeric NT dispersant in a manner where the associative groups are uncoupled from other associative groups, rendering the associative groups monomelic in nature. The degradable polymeric nanotube (NT) dispersant can be combined with carbon NTs to form a NT dispersion that can be deposited to form a NT film, or other structure, by air brushing, electrostatic spraying, ultrasonic spraying, ink-jet printing, roll-to-roll coating, or dip coating. The deposition can render a NT film that is of a uniform thickness or is patterned with various thicknesses. Upon deposition of the film, the degradable polymeric nanotube (NT) dispersant can be cleaved and the cleavage residues removed from the film to yield a film where contact between NTs is unencumbered by dispersants, resulting in highly conductive NT films.

**A. CLASSIFICATION OF SUBJECT MATTER***C08L 1/02(2006.01)i, C08K 3/04(2006.01)i, C08K 7/24(2006.01)i, C08L 101/16(2006.01)i, C08J 5/18(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

C08L 1/02; C07C 231/02; C07C 235/46

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) &amp; Keywords: carbon nanotube dispersant, CNT associative side chain, pyrene side chain, cleavable backbone, cleavable linker

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PETROV, P. et al. 'Noncovalent Functionalization of Multi-walled Carbon Nanotubes by Pyrene Containing Polymers.' In: Chem. Commun., 2003, pp. 2904-2905.	1-8, 10-12, 16-18
A	See abstract, schemes.	9, 13-15, 19-29
X	SALZMANN, C. G. et al. 'Highly Hydrophilic and Stable Polypeptide / Single-wall Carbon Nanotube Conjugates.' In: J. Mater. Chem., 2008, Vol. 18, pp. 1977-1983.	1-3, 5-11, 16-18
A	See abstract, figure 1.	4, 12-15, 19-29
X	ZHANG, W. et al. 'Electronic Interactions and Polymer Effect in the Functionalization and Solvation of Carbon Nanotube by Pyrene- and Ferrocene-Containing Poly(1-alkynes).' In: Macromolecules, 2008, Vol. 41, pp. 701-707. (-)	1-8, 10-12, 16-18
A	See abstract, scheme 1.	
A	JP 2006-265151 A (SHINSHU UNIV.) 05 October 2006 See the whole document.	1-29

 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents:

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"&amp;" document member of the same patent family

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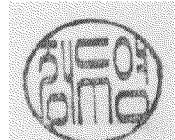
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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2006-265151 A	05.10.2006	JP 3985025 B2	03.10.2007