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(54) Title: **LATERALLY ALIGNED COLLOIDAL NANORODS ASSEMBLIES**

(57) Abstract: Nanorods assemblies that have lengths in excess of 50 microns to meters are formed from contacting rice-shaped colloidal superparticles that are aligned along the long axis of the colloidal superparticles. The rice-shaped colloidal superparticles are formed from a multiplicity of nanorods with a high degree of association that is end to end to form colloidal superparticles that are in excess of three microns in length and have a length to diameter ratio of about three or more. Methods of preparing the rice-shaped colloidal superparticles employ mixing with an additional ligand to the nanorods to bias the self assembly of the nanorods by solvophobic interactions. Methods of preparing the nanorods assemblies include the infusion of the rice-shaped colloidal superparticles into microchannels patterned on a substrate, wherein the rice-shaped colloidal superparticles' long axes align in the microchannels.



A. CLASSIFICATION OF SUBJECT MATTER**B82B 3/00(2006.01)i, B82B 1/00(2006.01)i, C08K 3/00(2006.01)i, C09K 11/08(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)

B82B 3/00; H01L 21/36; B05D 3/02; B82B 1/00; H01L 29/06; C09K 19/06; H01L 29/775

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: nanorod, colloid, superparticle, rice-shape, aspect ratio, and photonic sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2010/0028543 A1 (DAVIS, VIRGINIA A. et al.) 04 February 2010 See abstract and claims 1-24	1-39
A	US 7,225,082 B1 (NATAN, MICHAEL J. et al.) 29 May 2007 See abstract and claims 1-22	1-39
A	ZHUANG, JIAQI et al. Cylindrical superparticles from semiconductor nanorods. J. Am. Chem. Soc. 2009, Vol. 131, pp. 6084-6085 See Scheme 1 and Figure 1	1-39
A	US 2010/0264403 A1 (SIRRINGHAUS, HENNING et al.) 21 October 2010 See abstract and claims 1-55	1-39



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

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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
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