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[Continued on next page]

(54) Title: NANOPARTICLE THIN-FILM COATINGS FOR ENHANCEMENT OF BOILING HEAT TRANSFER

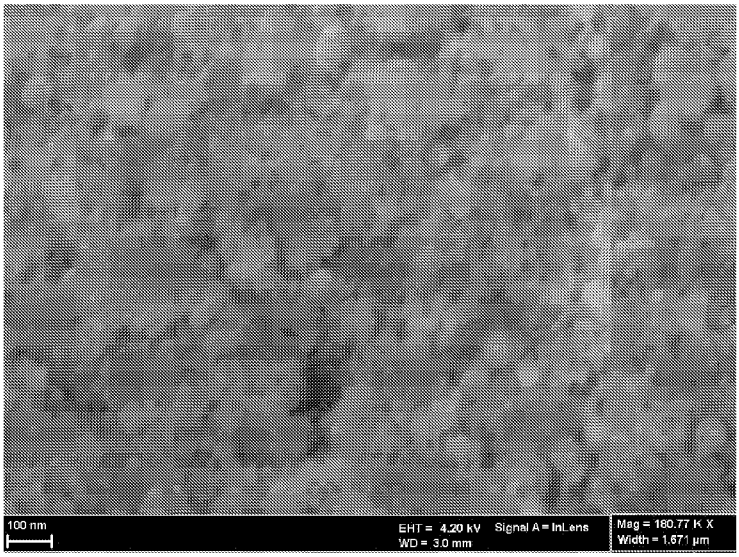

FIG. 3

(57) Abstract: A superhydrophilic thin film is formed on a metal surface of a boiler vessel to alter the wettability and roughness of the surface, which, in turn, changes the boiling behavior at the surface. The superhydrophilic film is formed by depositing a layer of a first ionic species on the surface from a solution. A second ionic species having a charge opposite to the that of the first ionic species is then deposited from solution onto the surface to produce a bilayer of the first ionic species and the oppositely charged second ionic species. The depositions are then repeated to form a plurality of bilayers, on top of the preceding bilayer. The bilayers are then heated, leaving the second ionic species on the metal surface to form a superhydrophilic film.

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A. CLASSIFICATION OF SUBJECT MATTER

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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)

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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:superhydrophilic thin film, boiler vessel

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CEBECI F. et al., Nanoporosity-Driven Superhydrophilicity: A Means to Create Multifunctional Antifogging Coatings, Langmuir, 2006, vol.22, no.6, pp.2856-2862 See abstract and p.2857	1-17
A	US 2007-0104922 A1 (LEI ZHAI et al.) 10 May 2007 See column 2 and claims	1-17
A	US 2008-0038458 A1 (ZEKERIYYA GEMICI et al.) 14 February 2008 See column 4 and claims	1-17
A	LEE D. et al., All-Nanoparticle Thin-Film Coatings, Nano Letters, 2006, vol.6, no.10, pp.2305-2312 See abstract	1-17
A	US 2007-0166513 A1 (XIAOXIA SHENG et al.) 19 July 2007 See claims	1-17
A	US 2008-0268229 A1 (LEE DAEYEON et al.) 30 October 2008 See claims 1,6-12	1-17

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Information on patent family members

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