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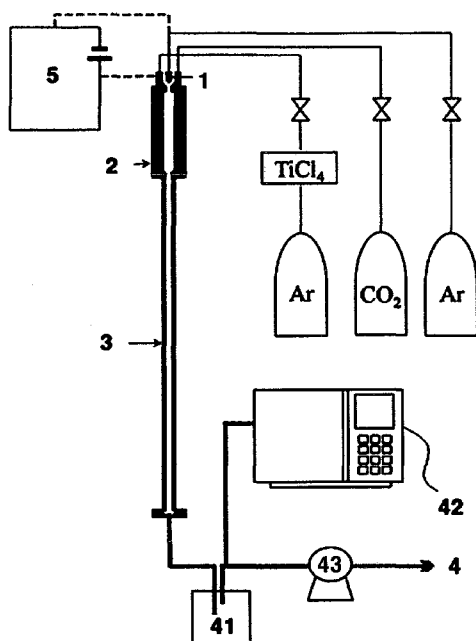
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(54) Title: METHOD OF PREPARING CARBON-DOPED TITANIUM DIOXIDE NANOPARTICLES BY DECOMPOSING CARBON DIOXIDE USING THERMAL PLASMA

[Fig. 1]



(57) Abstract: Disclosed is a method of preparing carbon-doped titanium dioxide nanoparticles by decomposing carbon dioxide using thermal plasma, including injecting carbon dioxide and titanium tetrachloride into a reaction tube of a thermal plasma jet system, decomposing the injected carbon dioxide by a thermal plasma jet generated using argon, so that it reacts with titanium tetrachloride transferred by a carrier gas, thus producing carbon-doped titanium dioxide, and cooling the carbon-doped titanium dioxide, thus preparing carbon-doped titanium dioxide nanoparticles. This method decomposes carbon dioxide within a short time thus reducing global warming and showing high decomposition efficiency, and does not need post-treatment thanks to the use of thermal plasma having high temperature and high activity, without concern about the production of secondary pollutants. The carbon-doped anatase titanium dioxide having a size of 20-50 nm exhibits superior photocatalytic activity in the UV/visible range, with a high specific surface area, and thus is efficiently employed as a photocatalyst.



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A. CLASSIFICATION OF SUBJECT MATTER***B82B 3/00(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)

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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: carbon, doping, TiO₂, thermal plasma and CO₂**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-0613122 B1 (HONG, YONG CHEOL et al.) 17 August 2006 See abstract	1-9
A	KR 10-0788413 B1 (KIM, HEON CHANG et al.) 24 December 2007 See abstract	1-9
A	CHEN, DAIMEI et al., Carbon and Nitrogen Co-doped TiO ₂ with Enhanced Visible-Light Photocatalytic Activity, Ind. Eng. Chem. Res., 25 April 2007, Vol. 46, pp. 2741-2746 See abstract	1-9
A	WANG, XINGXUE et al., Surface initiated graft polymerization from carbon-doped TiO ₂ nanoparticles under sunlight illumination, Polymer, 21 September 2007, Vol. 48, pp. 5834-5838 See abstract	1-9



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KR 10-0613122 B1

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