(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :16/05/2017

(21) Application No.201731017087 A
(43) Publication Date : 16/06/2017

(54) Title of the invention : ADVANCEMENT IN METHODOLOGY AND SYSTEM TO CONTROL ISOTOPIC FRACTIONATIONS IN CARBON CONTAINING GASES

(51) International classification	:B01D 59/00, B01D 53/00 G01N 33/00	(71)**Name of Applicant :** **1)S.N. BOSE NATIONAL CENTRE FOR BASIC SCIENCES** Address of Applicant :J.D. Block, Sector III Salt Lake Kolkata West Bengal India 700098 West Bengal India
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(86) International Application No	:NA	**4)PRADHAN, Manik**
Filing Date	:NA	**5)GHOSH, Barnali**
(87) International Publication No	: NA	
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :
A methodology and system for preferential adsorption of isotope of carbon containing gases involving a selective nanostructured material having specific porosity and large aspect ratio. In particular the advancement can selectively control the isotope fractionations of CO2 (12C16O2, 13C16O2) i.e. 13C in gases. Importantly, the advancement provides a physical process based isotope selective adsorption of carbon containing gas exploiting a simple nanostructured material having specific porosity and large aspect ratio to selectively adsorb isotopic CO2 from environment. The selective adsorption of isotopes of carbon containing gas (12CO2) takes place from an environment having minimum ppm of 300 at a temperature above 25oC. The preferential isotopic adsorption of carbon containing gas finds application in medical diagnostic devices, gas fractionation isotopically and similar fields.

No. of Pages : 28 No. of Claims : 23