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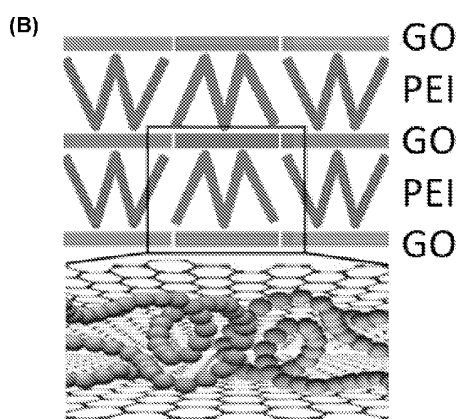
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(54) Title: A SEMI-PERMEABLE MEMBRANE

Figure 1



(57) Abstract: There is provided a semi-permeable membrane comprising: at least two dimensional (2D) heterostructure layers of; and a polyelectrolyte layer between each 2D heterostructure layer of the at least two 2D heterostructure layers. There is also provided a method of preparing the membrane comprising: mixing a 2D heterostructure solution and a polyelectrolyte solution to form a mixture; and vacuum filtering the mixture onto a substrate to form the membrane. In a preferred embodiment, the 2D heterostructure layer comprises graphene oxide, and the polyelectrolyte layer comprises polyethyleneimine (PEI).

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