

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202441036272 A

(19) INDIA

(22) Date of filing of Application :07/05/2024

(43) Publication Date : 07/06/2024

(54) Title of the invention : TiO<sub>2</sub> @ ZIF67 INCORPORATED PVDF MEMBRANES FOR THE REMOVAL OF HAZARDOUS REACTIVE BLACK 5 AND CONGO RED DYES FROM WATER

<p>(51) International classification :B01D0067000000, B01D0071340000, B01D0069020000, B01D0069140000, B01D0069080000</p> <p>(86) International Application No :NA Filing Date :NA</p> <p>(87) International Publication No : NA</p> <p>(61) Patent of Addition to Application Number :NA Filing Date :NA</p> <p>(62) Divisional to Application Number :NA Filing Date :NA</p>	<p>(71)Name of Applicant : <b>1)National Institute of Technology Karnataka</b> Address of Applicant :Srinivasnagar PO, Surathkal, Mangaluru - 575025, Karnataka, India Mangalore ----- -----</p> <p><b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b></p> <p>(72)Name of Inventor : <b>1)Arun M. Isloor</b> Address of Applicant :Dept. of Chemistry, National Institute of Technology Karnataka (NITK), Surathkal, P.O.Srinivasnagar,Mangaluru-575 025, Karnataka, India. Mangalore ----- -----</p> <p><b>2)Nethravathi Prabhakar</b> Address of Applicant :Dept. of Chemistry, National Institute of Technology Karnataka, Surathkal (NITK), P.O.Srinivasnagar,Mangaluru-575 025, Karnataka, India. Mangalore ----- -----</p>
---	--

(57) Abstract :

A method of preparation of a TiO<sub>2</sub>@ZIF-67 incorporated mixed matrix PVDF flat-sheet membranes (200 and 210) comprising: take a different volumes of N-methyl pyrrolidone (NMP) in a 50 mL capacity clean and dry reagent bottles (201); adding 1% of a pore forming polymer polyvinylpyrrolidone to all the bottles and sonicated (202); adding a different weight percentage of a TiO<sub>2</sub>@ZIF-67 composite to all the bottles and well dispersed by sonication (203); adding a polymer polyvinylidene fluoride powder in a desired ratio to obtain a dope solution (204); maintaining the temperature of the dope solution below 60 °C to achieve homogeneity under stirring for 24 hrs to obtain a homogeneous dope solution (205); casting the homogeneous dope solution into a membrane flat-sheets (206); and immersing the membrane flat-sheets in a coagulation bath that contains water as phase inverting non-solvent and drying in an oven to obtain a PVDF mixed matrix membrane, wherein the obtained TiO<sub>2</sub>@ZIF-67 incorporated mixed matrix PVDF flat-sheet membranes used for the treatment of water contaminated with hazardous Reactive black 5 and congored dyes with an enhanced dye removal efficiency by its photocatalytic degradation capability and also improvising the hydrophilic property of PVDF membrane. << FIG. 2A & FIG. 2B >>

No. of Pages : 30 No. of Claims : 10