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Synthesis of Nanostructured Titanium Dioxide Layer onto Kaolin Hollow Fibre Membrane via Hydrothermal Method for Decolourisation of Reactive Black 5



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1 **Synthesis of Nanostructured Titanium Dioxide Layer onto Kaolin Hollow Fibre**
2 **Membrane via Hydrothermal Method for Decolourisation of Reactive Black 5**

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13 **ABSTRACT**

14 Hydrothermal method has been proven to be an effective method to synthesise the
15 nanostructured titanium dioxide (TiO₂) with good morphology and uniform distribution at low
16 temperature. Despite of employing well-known and commonly used glass substrate as the
17 support to hydrothermally synthesise the nanostructured TiO₂, this study emphasised on the
18 application of kaolin hollow fibre membrane as the support for the fabrication of kaolin/TiO₂
19 nanorods (TNR) membrane. By varying the hydrothermal reaction times (2 h, 6 h, and 10 h),
20 the different morphology, distribution, and properties of TiO₂ nanorods on kaolin support were
21 observed by field emission scanning electron microscopy (FESEM), energy-dispersive X-ray
22 spectroscopy (EDX), atomic force microscope (AFM), X-ray diffraction (XRD) and Fourier
23 transform infrared spectroscopy (FTIR). The well-dispersed of TiO₂ nanorods have improved
24 the surface affinity of kaolin/TNR membrane towards water, allowing kaolin/TNR membrane

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