

# **Preparation of dextran cryogels for separation processes of binary dye and pesticide mixtures from aqueous solutions**

Betul Ari<sup>1</sup>, Berkant Yetiskin<sup>2</sup>, Oguz Okay<sup>2</sup>, Nurettin Sahiner<sup>1,3,4,a</sup>

<sup>1</sup>Department of Chemistry, Canakkale Onsekiz Mart University, 17100-Canakkale, Turkey,

<sup>2</sup>Department of Chemistry, Istanbul Technical University, 34469 Maslak, Istanbul, Turkey,

<sup>3</sup>Nanoscience and Technology Research and Application Center (NANORAC), Terzioglu Campus, 17100-Canakkale, Turkey,

<sup>4</sup>Department of Ophthalmology, University of South Florida, Tampa, FL, 33612, USA.

<sup>a</sup>Address all correspondence to this author. E-mail: [sahiner71@gmail.com](mailto:sahiner71@gmail.com); [nsahiner@usf.edu](mailto:nsahiner@usf.edu)

## 1. Hemolysis tests

Fresh blood taken from healthy and volunteer humans was placed in EDTA-containing hemogram tubes. For this test, 2 mL of fresh blood was diluted with 2.5 mL of 0.9% saline at 37.5 °C. Nearly 10 mg of dextran cryogel was placed in 10 mL of 0.9% saline at 37.5 °C and 0.2 mL of diluted blood was added into this solution. The blood solution containing cryogel was incubated at 37.5 °C for 1 h and the suspension of these solutions were centrifuged at 100g for 5 min and the absorbance values of the supernatant solution were determined using UV-Vis spectroscopy at 542 nm (UV-Vis Spec., T80+, PG Instrument Limited).

$$\text{Hemolysis ratio \%} = (A_{\text{sample}} - A_{\text{negative}}) / (A_{\text{positive}} - A_{\text{negative}}) \times 100 \quad (\text{S1})$$

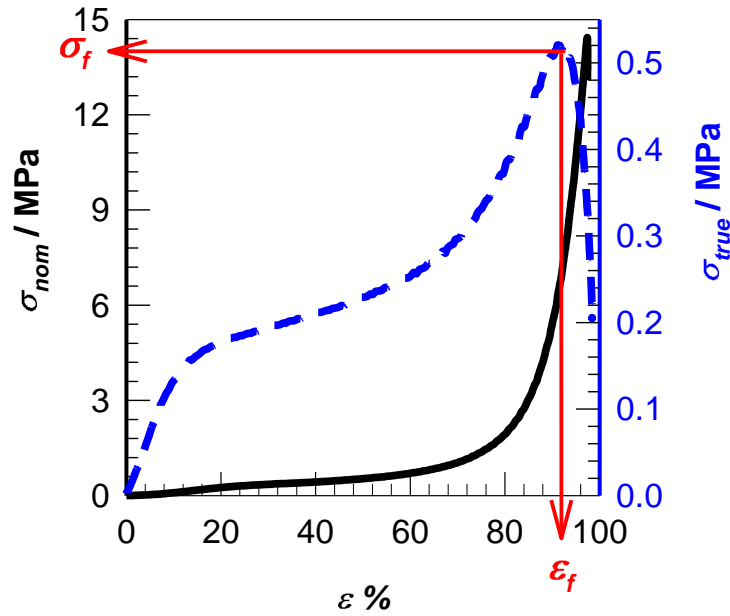
Here,  $A_{\text{sample}}$ ,  $A_{\text{positive}}$  and  $A_{\text{negative}}$  are the absorbance values of sample, positive and negative control, respectively.

## 2. Blood clotting tests

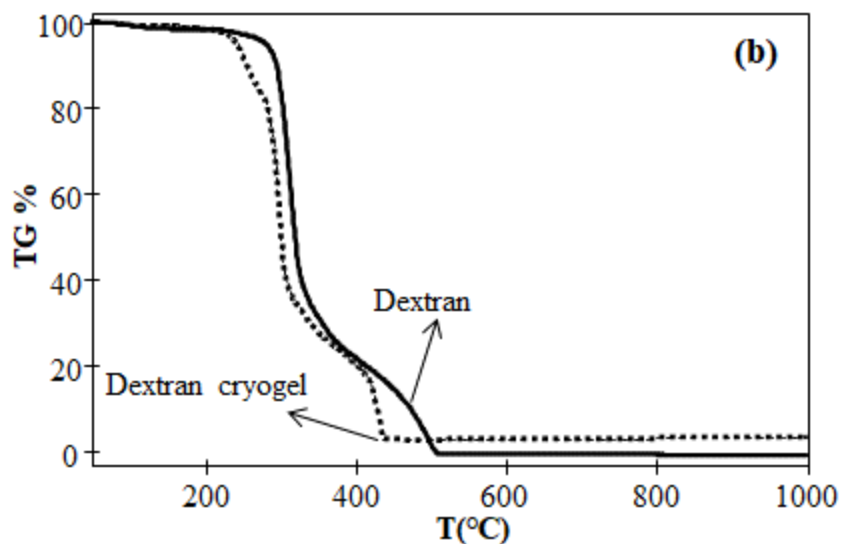
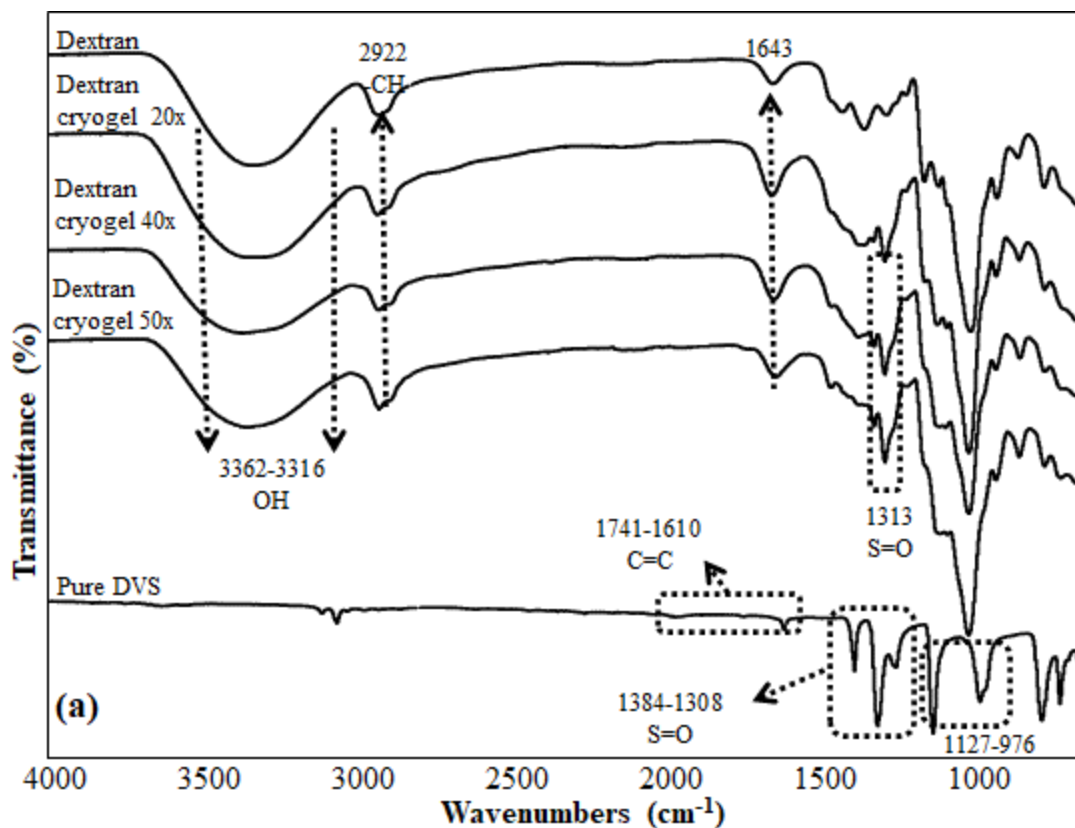
For the blood clotting test, about 10 mg of the dextran cryogel was swollen with a few drops of 0.9% saline at 37.5 °C. In another tube, 64.8 μL of 0.2 M CaCl<sub>2</sub> solution was added to 810 μL of fresh blood and immediately 270 μl of the blood solution was dropped on the dextran cryogel and left for 10 min at 37.5 °C. After 10 min, 10 mL of distilled water, which was kept at 37.5 °C, was slowly placed onto the blood-containing cryogel and centrifuged at 100 g for 1 min. The supernatant solution was taken and added to 40 mL of distilled water and left for incubation for 1 hour at 37.5 °C. The absorbance values of the supernatant solution were determined at 542 nm using UV-Vis spectroscopy.

$$\text{Blood clotting index} = (A_{\text{cryogel + blood}} / A_{\text{blood}}) \times 100 \quad (2)$$

All the blood compatibility tests were performed with three replicates and the results are given as the average values with standard deviations.



**FIGURE S1** Typical nominal stress  $\sigma_{nom}$  – strain  $\varepsilon$  (black solid) and true stress  $\sigma_{true}$  –  $\varepsilon$  curves (blue dashed) of dextran cryogels. According to the  $\sigma_{nom}$  –  $\varepsilon$  curve, the cryogel specimen sustains up to around 97% strain under 15 MPa compressive stress. However, the corresponding  $\sigma_{true}$  –  $\varepsilon$  curve derived from  $\sigma_{nom}$  –  $\varepsilon$  passes through a maximum at a much lower strain, indicating formation of microcracks in the cryogel specimen at a stress of below 15 MPa, which is not detectable in the  $\sigma_{nom}$  –  $\varepsilon$  curve. For all cryogels, we calculated the fracture stress  $\sigma_f$  and fracture strain  $\varepsilon_f$  from the maxima of  $\sigma_{true}$  –  $\varepsilon$  curves, as indicated by the red arrows in Figure 2a.



**FIGURE S2.** (a) FT-IR spectra of branched dextran, dextran cryogel and pure DVS crosslinker (b) and their TGA curves.