ABSTRAK

PENGARUH VARIASI SiO_2 DALAM PEMBUATAN *NANOFIBER* KOMPOSIT PVA/SiO_2 DARI SILIKA SEKAM PADI MENGGUNAKAN METODE *ELECTROSPINNING*

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Telah dilakukan sintesis *nanofiber* komposit PVA/SiO_2 menggunakan metode *electrospinning*. Penelitian ini bertujuan untuk mengetahui pengaruh variasi SiO_2 pada sintesis *nanofiber* komposit PVA/SiO_2 terhadap porositas, *shrinkage* dan morfologi. Variasi SiO_2 yang digunakan yaitu 0; 0,6; 1,2; 2 *wt*%. Proses sintesis *nanofiber* komposit PVA/SiO_2 melalui metode *electrospinning* dilakukan pada tegangan 20 kV dengan laju alir 2,5 ml/jam. *Nanofiber* komposit PVA/SiO_2 hasil sintesis dioven pada suhu 80^oC selama 8 jam. Pada *nanofiber* komposit PVA/SiO_2 dilakukan pengujian: porositas & *shrinkage* dan dilakukan karakterisasi *Scanning Electron Microscopy* (SEM). Pada larutan PVA/SiO_2 dengan variasi SiO_2 0 *wt*% (PS-0%); 0,6 *wt*% (PS-0,6%); 1,2 *wt*% (PS-1,2%) dan 2 *wt*% (PS-2%) diperoleh viskositas masing-masing adalah 0,35; 0,37; 0,45 dan 0,7 Pa.s serta tegangan permukaan larutan PVA/SiO_2 masing-masing adalah 29 ± 4 dyn/cm; 34 ± 4 dyn/cm; 39 ± 4 dyn/cm; 39 ± 3 dyn/cm. Hasil uji porositas *nanofiber* komposit PVA/SiO_2 pada sampel PS-0%, PS-0,6%, PS-1,2%, PS-2% masing-masing sebesar 51; 58; 63; dan 68 % dan hasil uji *shrinkage* masing-masing sebesar 59,89; 30,56; 12,89; 0; 0 %. Hasil Karakterisasi SEM pada sampel masing-masing adalah 219 nm, 210 nm, 205 nm, dan 200 nm.

Kata kunci: *nanofiber* komposit PVA/SiO_2, *electrospinning*, variasi SiO_2, PVA.

ABSTRACT

THE EFFECT OF SiO_2 VARIATIONS IN MANUFACTURING PVA/SiO_2 COMPOSITE NANOFIBERS FROM RICE HUSK SILICA USING THE ELECTROSPINNING METHOD

By

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Synthesis of PVA/SiO_2 composite nanofibers has been carried out using the electrospinning method. This research aims to determine the effect of SiO_2 variations in the synthesis of PVA/SiO_2 composite nanofiber on porosity, shrinkage and morphology. The SiO_2 variations used are 0; 0,6; 1,2; 2wt%. The process of synthesizing PVA/SiO_2 composite nanofibers using the electrospinning method was carried out at a voltage of 20 kV with a flow rate of 2,5 ml/hour. The synthesized PVA/SiO_2 composite nanofiber was oven-dried at 80^oC for 8 hours. The PVA/SiO_2 composite nanofiber was tested for: porosity & shrinkage and Scanning Electron Microscopy (SEM) characterization was carried out. In the PVA/SiO_2 solution with variations of SiO_2 0 wt% (PS-0%); 0,6 wt% (PS-0,6%); 1,2 wt% (PS-1,2%) and 2 wt% (PS-2%) obtained a viscosity of 0,35 respectively; 0,37; 0,45 and 0,7 Pa.s and the surface tension of the PVA/SiO_2 solution is 29 ± 4 dyn/cm respectively; 34 ± 4 dyn/cm; 39 ± 4 dyn/cm; 39 ± 3 dyn/cm. The results of the PVA/SiO_2 composite nanofiber porosity test on PS-0%, PS-0.6%, PS-1.2%, PS-2% samples were 51; 58; 63; and 68% and the shrinkage test results were 59,89; 30,56; 12,89; 0; 0 %. The SEM characterization results for the samples were 219 nm, 210 nm, 205 nm and 200 nm, respectively.

Keyword: PVA/SiO_2 composite nanofiber, electrospinning, variations of SiO_2, PVA.