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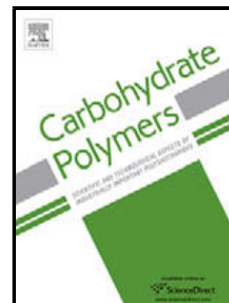
Title: Effect of Different Polyol-Based Plasticizers on Thermal Properties of Polyvinyl Alcohol (PVA):Starch Blends Films

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1 **Effect of Different Polyol-Based Plasticizers on Thermal Properties of Polyvinyl Alcohol**
2 **(PVA):Starch Blends Films**

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8 **Abstract**

9 A series of gelatinized polyvinyl alcohol (PVA):starch blends were prepared with various polyol-
10 based plasticizers in 5 wt%, 15 wt% and 25 wt% ratios via solution casting method. The obtained
11 films were analyzed by Fourier transform infrared (FT-IR) spectroscopy, differential scanning
12 calorimetry (DSC) and thermogravimetric analysis (TGA). Remarkable changes have been
13 observed in glass-transition temperature (T_g) and thermal stability of the samples containing
14 varying concentrations of different plasticizers and they have been discussed in detail with
15 respect to the conducted thermal and chemical analyses. The observed order of T_g point
16 depression of the samples with containing 15 wt% plasticizer content is 1,4-butanediol - 1,2,6-
17 hexanetriol - pentaerythriol - xylitol - mannitol, which is similar to the sequence of the thermal
18 stability changes of the samples. In the presence of 25 wt % 1,4-butanediol, the T_g point of
19 PVA:starch films reduce from 76.1°C to 37.2°C.

20 **Keywords:** starch; polyvinyl alcohol; plasticizer; polyol; thermal properties; glass transition

21 **Chemical compounds studied in this article:** Corn Starch (PubChem CID: 24836924);
22 Polyvinyl Alcohol (PubChem CID: 11119); 1,4-Butanediol (PubChem CID: 8064); 1,2,6-
23 Hexanetriol (PubChem CID: 7823); Pentaerythritol (PubChem CID: 8285); Xylitol (PubChem
24 CID: 6912); Mannitol (PubChem CID: 6251)

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