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# NEW BIODEGRADABLE NANOCOMPOSITES BASED ON NANOPARTICLES OF CELLULOSE AND POLYURETHANE

K. Benhamou[a*], H. Kaddami[a], F.Erchique[b], M. Raihane[a], M. Lahcini[a], R. Joffe[c], A. Dufresne[d] ,

[a] *Equipe Chimie Organométallique et Macromoléculaire- Matériaux Composites,Université Cadi Ayyad, Faculté des Sciences et Techniques, Avenue A ; El Khattabi, B.P. 549, Marrakech, Maroc,* [b] *Université du Québec en Abitibi- Témiscamingue, 445 boul. de l'Université, Rouyn-Noranda QC, J9X 5E4, Canada,* [c]*Universitetslektor Department of Engineering Sciences and MathematicsLuleå University of Technology, 971 87 Luleå, Sweden and* [d]*Institut National Polytechnique de Grenoble, Ecole Pagora, Saint Martin d'Hérès, France*

**Corresponding author:* karimabenhamou@gmail.com

To solve the environmental issues of our daily lives, a solution would be to prepare fully biodegradable materials from renewable resources having good properties. In this theme that fits our project. The goal of this study is to develop nanaocomposites based on cellulose nanofillers extracted from the rachis date palm and on polyurethane based on polycaprolactone (PCL). Thermal analysis by DSC of these materials have highlighted the effect of these cellulosic nanofillers (monocrystals and microfibrils) on the degree of crystallinity of the polyurethane matrix. In fact, it is increased from 35% for the neat polyurethane to 45% for a nanocomposite filled with 10 wt %. The tensil test characterizations tension showed a significant improvement of the mechanical properties when only of 1% nanofillers is introduced in the composite, particularly for the materials based on cellulose monocristals. For the materials based on cellulose microfibrils the improvement is less important. On the other hand, the introduction of cellulose nanofillers in the polyurethane matrix increase it hydrophilicity. In summary, this study enabled to show the interest of the use of cellulose monocrystals as nanofillers in biodegradable nanocomposite materials.