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# Regenerated Cotton/Feather Keratin Composite Materials Prepared Using Ionic Liquids

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**Abstract :** We report on the blending of cotton and duck feather towards developing a new textile fibre. The cotton and duck feather were blended together by dissolving both components in an ionic liquid. Ionic liquids are designer solvents consisting entirely of ions with a melting point below 100˚C. Ionic liquids can be designed to have numerous and varied properties which include the ability to dissolve bio polymers. The dissolution of bio polymers such as cotton or wool generally requires very harsh acid or alkaline conditions and high temperatures. The ionic liquids which can dissolve bio polymers can be considered environmentally benign since they have negligible vapor pressure and can be recycled and reused. We have selected the cellulose dissolving and recyclable ionic liquid 1-allyl-3-methylimidazolium chloride (AMIMCl) as the dissolving and blending solvent for the cotton and duck feather materials. We have casted films and wet spun fibres at varying cotton and duck feather compositions and characterized the material properties of these. We find that the addition of duck feather enhances the elasticity of regenerated cotton. The strain% at breakage of the regenerated film was increased from 4.2% to 11.63% with a 10% duck feather loading, while the corresponding stress at breakage reduced from 54.89 MPa to 47.16 MPa.

**Keywords :** textile materials, bio polymers, ionic liquids, duck feather
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