Study on friction and wear of Cellulose Nanocrystal (CNC) nanoparticle as lubricating additive in engine oil

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ABSTRACT
A novel Cellulose Nanocrystals (CNC) nanoparticles were proposed as green additive as green additives for improving tribological properties of lubricants. Enhanced tribological performance was measured using piston–skirt liner tribometer under variable load, speed and temperature; and varying concentrations of nanoparticles in lubricating oil. Study on a worn surface on the plate was characterized by SEM and EDX. This study shows that the mixing of CNC nanoparticles in engine oil significantly reduces the friction and wear rate and hence improves the lubricating properties of engine oil. Base oil containing 0.1% CNC demonstrates excellent tribological properties including the lowest COF and the strongest wear resistance under all lubrication conditions. An elemental content in EDX analysis reveals that Carbon and Aluminum were the most elements present.