



## **A study on polyamide nanocomposite using nanoclays nanofillers reclaimed from oil and drilling fluids and cuttings waste**

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This paper focuses on a new innovative method of utilizing solid extracts including bentonite from oil and gas drilling wastes by separating the recoverable minerals, water and oil. The recovered minerals, are chemically processed, modified and next used as nanofiller reinforcement to develop advanced lightweight materials. In particular, two- and three-phased composites were prepared using nanofillers nano-silica (nano-SiO<sub>2</sub>) and nano-clay and micro glass-spheres to reinforce polyamide (PA6) and its glass-fibre reinforced thermoplastic composites. The polyamide composites are manufactured using injection moulding process.

These novel composites were examined for morphological property using Transmission Electron Microscopy (TEM) and X-ray diffraction and the nature of surface fracture using Scanning Electron Microscopy (SEM). Further, the mechanical properties are investigated. The investigation results show that the nanofillers were successfully dispersed and embedded in the polymer matrices to obtain nanocomposite material. The tensile and compression properties of were improved for both two- and three-phased composites providing the opportunity for material tailoring to achieve customised mechanical performance. The study findings will be covered, discussed and scope for further work outlined in light of develop of the new structural material grade for energy applications. The study offers a good opportunity to employ by-products of spent oily drilling muds and cuttings slop and that way positively contribute to environmental impact.

### References

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