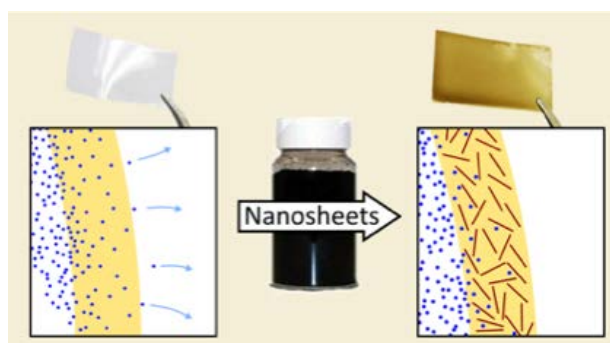


WM-1407: POLYAMIDE COMPOSITES CONTAINING GRAPHENE SHEETS

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Application: Polyamides with improved functional properties, particularly useful for specialty polyamides used, for example, in flexible pipes in the petroleum industry.

Technology Background: The inventors have developed a novel approach to incorporate graphene oxide into various polymers to produce composites, followed by reduction of the graphene oxide upon modest heating to yield polymer composites incorporating well-dispersed graphene-like sheets. This method is disclosed in granted U.S. Patent No. 9,162,896.



We have found that this method is particularly useful for specialty polyamide compositions, particularly for PA-11 and PA-12. The graphene oxide/polyamide composites have enhanced durability, reduced water uptake, and reduced susceptibility to hydrolysis relative to polyamides lacking the graphene oxide.

The improved durability is crucial in oilfield risers – pipe liners using our polyamide composites should last greater than 20 years on average. Given typical value of crude flow of \$1M per day per pipe, and the huge costs associated with replacement, any significant increases in durability provide tremendous financial savings. Moreover, the enhanced resistance to hydrolysis allows increased operating temperatures, thereby facilitating pumping from deeper crude oil reservoirs.



Intellectual Property: Patent pending, also issued patent 9,162,896.

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