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(54) Title: FACILE SYNTHESIS OF GRAPHENE, GRAPHENE DERIVATIVES AND ABRASIVE NANOPARTICLES AND THEIR VARIOUS USES, INCLUDING AS TRIBOLOGICALLY-BENEFICIAL LUBRICANT ADDITIVES

(57) Abstract: Methods of ex situ synthesis of graphene, graphene oxide, reduced graphene oxide, other graphene derivative structures and nanoparticles useful as polishing agents are disclosed. Compositions and methods for polishing, hardening, protecting, adding longevity to, and lubricating moving and stationary parts in devices and systems, including, but not limited to, engines, turbos, turbines, tracks, races, wheels, bearings, gear systems, armor, heat shields, and other physical and mechanical systems employing machined interacting hard surfaces through the use of nano-polishing agents formed in situ from lubricating compositions and, in some cases, ex situ and their various uses are also disclosed.



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