

PROCNANO[®] TECHNICAL DATA SHEET

SUPPLIER	
Proton Power, Inc., Dr. Sam Weaver, (865) 389-4713, scweaver@protonpower.com	
CAS NUMBER: 1034343-98-0	
PRODUCT: ProCnano [®]	
PRODUCT DESCRIPTION	
ProCene is a few layer turbostratic graphene in dry powder form that is produced via pyrolysis of biomass in particle sizes ranging from 6 to 25 microns.	

PRODUCTION INFORMATION	
PRODUCTION METHOD	Pyrolysis
RAW MATERIAL	Biomaterials
FORMS OF MATERIALS	Dry Powder (Pwd)

CHARACTERISTIC	TEST METHOD	VALUE (*D90)
SP2 Bonded Carbon	X-ray Photoelectron Spectroscopy (XPS)	Yes
Structural Defects	Raman Spectroscopy (Raman)	"Large" defects, "Good" crystallinity
Number of Layers	Raman	Few layers
Z-Axis Dimensions	Raman	35 nm
Primary Particle Shape	Scanning Electron Microscopy (SEM)	Platelet
Lateral Dimensions	Microtrac Particle Size Analyzer	26 microns
Aspect Ratio	Microtrac Particle Size Analyzer	1000
Tapped Bulk Density	Tapped density measurement	0.5 g/cm ³
Chemical/Elemental Composition	Inductively Coupled Plasma Spectroscopy (ICP)	91.00% Carbon 7.00% Oxygen 1.00% Hydrogen 0.50% Nitrogen 0.46% Metals
Oxygen Content %w	CHN 828 Leco Elemental Analyzer	7%
Impurities %w	CHN 828 Leco Elemental Analyzer + ICP	See above
Graphene Orientation	Transmission Electron Microscopy (TEM)	Turbostratic
Specific Surface Area (SSA)		tbd

Crystallinity

X-ray Diffraction

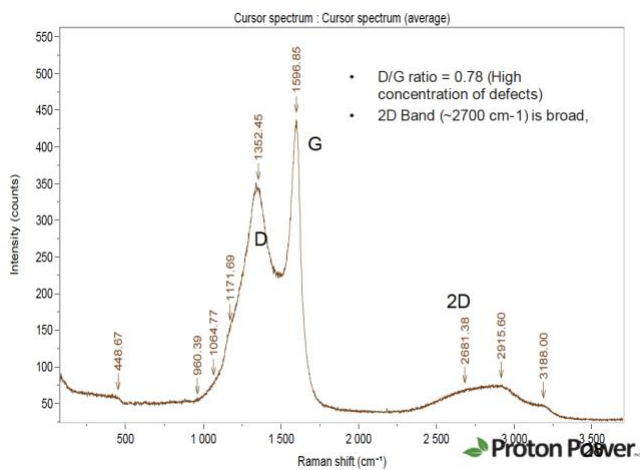
Crystalline

DETAILED TECHNICAL ASPECTS

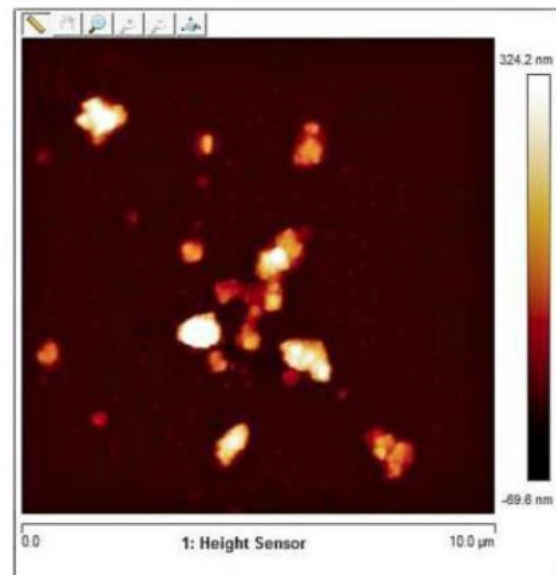
PARAMETERS	
Appearance	Dry, black powder
Shape and Form	Platelets in dry, black powder
C/O ratio	13
Color	Black
Odor	None
Solubility in water	Not soluble
Dispersibility	Hydrophilic
Electrical Conductivity	2,000 Siemens/cm
Capacitance	217 F/g

GRAPHS AND IMAGES

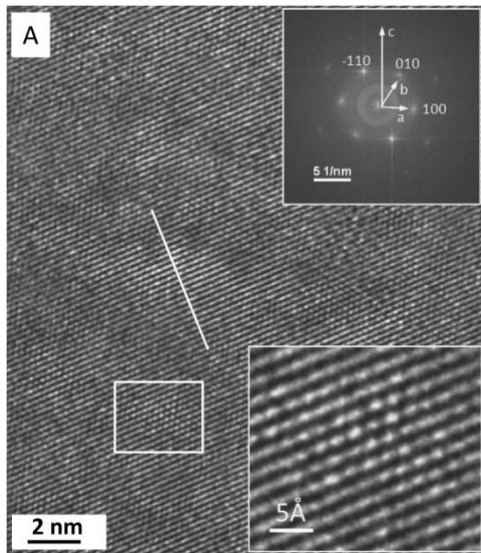
RAMAN



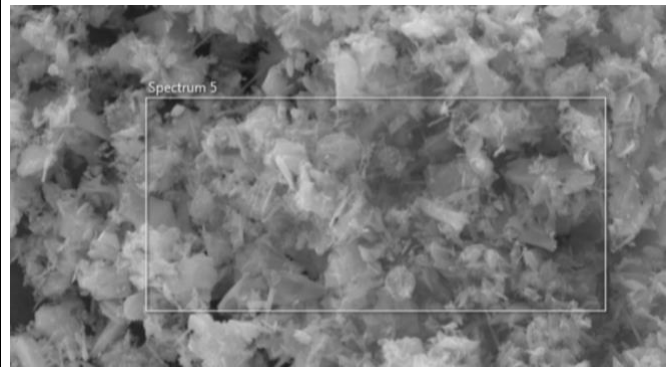
AFM



TEM



SEM



ADDITIONAL COMMENTS

ProCnano is produced from ProC[®] biochar which is a co-product of Proton Power, Inc. (PPI) systems that also produce renewable diesel, renewable hydrogen, or electricity from biomass feedstocks via a pyrolytic process. Therefore, because the ProC is produced from carbon removed from the atmosphere by plants, the ProCnano produced by PPI is environmentally friendly due to its extremely low carbon footprint.