



Xinfeng Xie

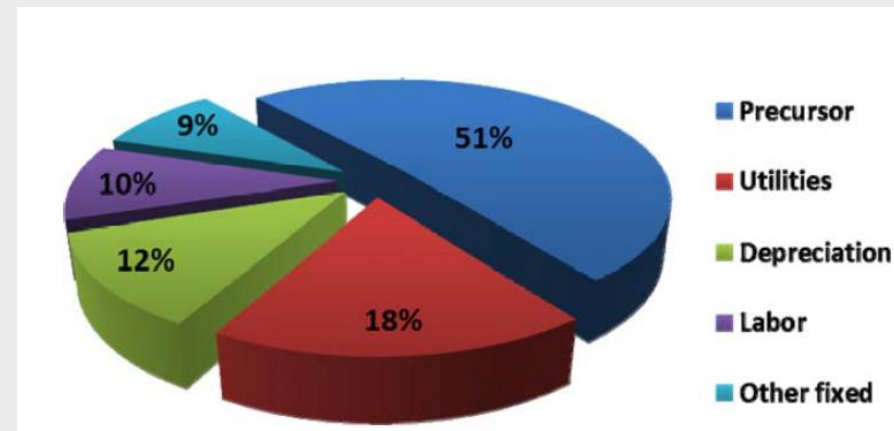


Prepare Lignin for Carbon Fiber Production

Carbon fiber is strong and light

	Tensile Strength	Young's Modulus	Density
Carbon fiber	3500MPa	230GPa	1.78g/cm ³
Steel	600MPa	200GPa	7.87g/cm ³

The production cost is >\$25/Kg (polyacrylonitrile, PAN based)



Production cost breakdown of PAN-based carbon fiber
(Baker and Rials 2013)

Lignin is the most cost-effective raw material for CF

- From renewable resources (biomass)
- The second most abundant natural polymer in the world
- An industrial byproduct from current pulping processes and future bio-refinery processes

Lack of Consistency in properties

	Tg (°C)	Cp (J/g°C)	Repeatability (W/g)
Willow	189.12	1.949	0.0198
Red Oak	183.86	2.474	0.0211
White Pine	189.72	1.823	0.0237
Miscanthus	192.86	1.777	0.0168

