WHAT IS CLAIMED IS:

1. A method of preparing functionalized graphene nanoribbons, wherein the method comprises:

exposing a plurality of carbon nanotubes to an alkali metal source in the presence of an aprotic solvent, wherein the exposing occurs in the absence of a protic solvent, and wherein the exposing opens the carbon nanotubes; and

exposing the opened carbon nanotubes to an electrophile to form functionalized graphene nanoribbons.

2. The method of claim 1, further comprising a step of exposing the opened carbon nanotubes to a protic solvent.

3. The method of claim 2, wherein the protic solvent is selected from the group consisting of formic acid, n-butanol, isopropanol, n-propanol, ethanol, methanol, acetic acid, water, hydrochloric acid, sulfuric acid, ammonia, diethyl amine, dialkylamines, monoalkylamines, diarylamines, monoarylamines, monoalkymonoarylamines, and combinations thereof.

4. The method of claim 1, wherein the carbon nanotubes are opened parallel to their longitudinal axis.

5. The method of claim 1, wherein the method takes place at room temperature.

6. The method of claim 1, wherein the carbon nanotubes are selected from the group consisting of single-walled carbon nanotubes, double-walled carbon nanotubes, triple-walled carbon

19. The method of claim 18, wherein the deintercalating occurs by heating the formed graphene nanoribbons.

20. The method of claim 1, further comprising a step of exfoliating one or more layers of graphene from the formed graphene nanoribbons.

21. The method of claim 20, wherein the exfoliating comprises exposure of the graphene nanoribbons to a gas, wherein the gas is selected from the group consisting of carbon dioxide, nitrogen gas, hydrogen gas, hydrogen chloride, air, and combinations thereof.

22. A method of preparing graphene nanoribbons, wherein the method comprises:

exposing a plurality of carbon nanotubes to an alkali metal source in the presence of an aprotic solvent, wherein the exposing occurs in the absence of a protic solvent, and wherein the exposing opens the carbon nanotubes; and

exposing the opened carbon nanotubes to a protic solvent to form unfunctionalized graphene nanoribbons.

23. The method of claim 22, wherein the carbon nanotubes are opened parallel to their longitudinal axis.

24. The method of claim 22, wherein the method takes place at room temperature.

25. The method of claim 22, wherein the carbon nanotubes are selected from the group consisting of single-walled carbon nanotubes, double-walled carbon nanotubes, triple-walled carbon nanotubes, multi-walled carbon nanotubes, ultra-short carbon nanotubes, and combinations thereof.

38. The method of claim 37, wherein the deintercalating occurs by heating the formed graphene nanoribbons.

39. The method of claim 22, further comprising a step of exfoliating one or more layers of graphene from the formed graphene nanoribbons.

40. The method of claim 39, wherein the exfoliating comprises exposure of the graphene nanoribbons to a gas, wherein the gas is selected from the group consisting of carbon dioxide, nitrogen gas, hydrogen gas, hydrogen chloride, air, and combinations thereof.

41. A composite comprising graphene nanoribbons,

wherein the graphene nanoribbons are derived from carbon nanotubes by the method of claim 1 or claim 22, and

wherein the graphene nanoribbons are edge-functionalized.

42. The composite of claim 41, wherein the graphene nanorribons contain unfunctionalized basal planes.

43. The composite of claim 41, wherein the graphene nanoribbons are edge-functionalized with polymers.

44. The composite of claim 43, wherein the polymers are selected from the group consisting of polystyrenes, polyisoprenes, polybutadienes, polyacrylonitriles, polymethyl vinyl ketones, poly alkyl acrylates, polyalkyl methacrylates, polyols, and combinations thereof.

45. The composite of claim 41, wherein the graphene nanoribbons are edge-functionalized with functional groups selected from the group consisting of alkyl groups, acyl groups, allylic groups, benzyl groups, benzylic groups, alkenyl groups, aryl groups, alkynyl groups, aldehydes, ketones, esters, carboxyl groups, carbonyl groups, halogens, and combinations thereof.

46. The composite of claim 41, wherein the edge-functionalized graphene nanorribons comprise at least one of alkyl-functionalized graphene nanoribbons, hexadecylated graphene nanoribbons, octylated graphene nanoribbons, butylated graphene nanoribbons, and combinations thereof.

47. The composite of claim 41, wherein the composites are utilized as components of at least one of transparent conductive displays, de-icing circuits, gas barrier composites, screens, and combinations thereof.

48. A fiber comprising graphene nanoribbons,

wherein the graphene nanoribbons are derived from carbon nanotubes by the method of claim 1 or claim 22, and

wherein the graphene nanoribbons are edge-functionalized.

49. The fiber of claim 48, wherein the graphene nanorribons contain unfunctionalized basal planes.

50. The fiber of claim 48, wherein the graphene nanoribbons are edge-functionalized with polymers.

51. The fiber of claim 50 ~~48~~, wherein the polymers are selected from the group consisting of polystyrenes, polyisoprenes, polybutadienes, polyacrylonitriles, polymethyl vinyl ketones, poly alkyl acrylates, polyalkyl methacrylates, polyols, and combinations thereof.

52. The fiber of claim 48, wherein the graphene nanoribbons are edge-functionalized with functional groups selected from the group consisting of alkyl groups, acyl groups, allylic groups, benzyl groups, benzylic groups, alkenyl groups, aryl groups, alkynyl groups, aldehydes, ketones, esters, carboxyl groups, carbonyl groups, halogens, and combinations thereof.

53. The fiber of claim 48, wherein the edge-functionalized graphene nanorribons comprise at least one of alkyl-functionalized graphene nanoribbons, hexadecylated graphene nanoribbons, octylated graphene nanoribbons, butylated graphene nanoribbons, and combinations thereof.

54. The fiber of claim 48, wherein the fibers are utilized as components of at least one of transparent conductive displays, de-icing circuits, gas barrier fibers, screens, and combinations thereof.