**WHAT IS CLAIMED IS:**

1. A method comprising:

(a) providing a first aerogel, wherein the first aerogel has a compression set greater than 15% as determined by ASTM D3574 – Test D;

(b) heating the first aerogel under an atmosphere comprising greater than 10% oxygen at a temperature between about 200 ºC and 400 ºC to obtain a second aerogel;

wherein the first aerogel is heated for a time sufficient to alter the compression set of the first aerogel such that the obtained second aerogel has a compression set less than or equal to 15% as determined by ASTM D3574 – Test D.

2. The method of claim 1, wherein the atmosphere comprises between about 15% oxygen to about 25% oxygen.

3. The method of claim 1, wherein the atmosphere is air.

4. The method of any one of the preceding claims, wherein the first aerogel is heated for a time of about 30 seconds or more.

5. The method of any one of the preceding claims, wherein the first aerogel is heated for a time of between about 30 seconds and about 3 hours.

6. The method of any one of the preceding claims, wherein during heating of the first aerogel the temperature is limited to a temperature below 400 ºC.

7. The method of any one of the preceding claims, wherein the first aerogel comprises silica.

8. The method of any one of the preceding claims, wherein the first aerogel comprises a base.

9. The method of claim 8, wherein the base is an amine base.

10. The method of claim 8 or 9, wherein the first aerogel comprises at least 0.5% of the base.

11. The method of claim 8 or 9, wherein the first aerogel comprises between 0.5% to about 10% of the base.

12. The method of claim 8 or 9, wherein the amount of base in the first aerogel is greater than the amount of base in the second aerogel.

13. The method of any one of the preceding claims, wherein the first aerogel is an aerogel composite comprising a reinforcement material.

14. The method of claim 13, wherein the reinforcement material is a fiber reinforcement material.

15. The method of any one of the preceding claims, wherein the first aerogel is an aerogel composite comprising an opacifying additive.

16. The method of claim 15, wherein the opacifying additive is selected from the group consisting of $B_4C$, Diatomite, Manganese ferrite, MnO, NiO, SnO, $Ag_2O$, $Bi_2O_3$, TiC, WC, carbon black, titanium oxide, iron titanium oxide, zirconium silicate, zirconium oxide, iron (I) oxide, iron (III) oxide, manganese dioxide, iron titanium oxide (ilmenite), chromium oxide, or mixtures thereof.

17. The method of claim 15, wherein the opacifying additive comprises silicon carbide.

18. The method of any one of the preceding claims, further comprising producing the first aerogel by the process comprising:

forming a wet gel material;

aging the wet gel material by heating the wet gel material with an aging fluid at an aging temperature and an aging pressure, wherein the aging temperature is above the normal boiling point of the aging fluid, wherein the pressure of the vessel is maintained above the vapor pressure of the aging fluid during heating; and

extracting the aging fluid from the heated wet-gel material to form the first aerogel.