[0012a] A fifth embodiment relates to an article comprising: a porous substrate comprising water wettable, high temperature staple fibers felted onto a high temperature fluoropolymer scrim, said porous substrate having catalyst particles adhered to the surface of said substrate by a polymer adhesive, wherein the particles are tethered to said substrate by adhesive strings of polymer.

[0012b] A sixth embodiment relates to a filter for use in a fluid stream comprising: at least one porous substrate comprising at least one porous layer of water wettable, high temperature staple fibers felted onto a high temperature fluoropolymer scrim, said substrate having a plurality of catalyst particles adhered to the surface thereof by a polymer adhesive, wherein the catalyst particles are tethered to said substrate by polymer adhesive string.

[0012c] A seventh embodiment relates to an article comprising: a first porous substrate; a second porous substrate; and a woven scrim positioned between and attached to said first and second porous substrates, wherein said first and second substrates comprise wettable, high temperature staple fibers, wherein at least one of said first porous substrate and said second porous substrate have catalyst particles adhered to the surface thereof by a polymer adhesive, and wherein said catalyst particles are tethered to said polymer adhesive by polymer strings.

What is claimed is:

1. An article comprising:

a porous substrate comprising water wettable, high temperature staple fibers felted onto a high temperature fluoropolymer scrim, said porous substrate having catalyst particles adhered to the surface of said substrate by a polymer adhesive, wherein the particles are tethered to said substrate by adhesive strings of polymer.

2. The article of claim 1, wherein the catalyst particles comprise vanadium oxide on titanium oxide.

3. The article of claim 1, wherein said polymer adhesive comprises at least one material selected from the group consisting of FEP, PTFE, HMWPE and HMWPP, PFA, PVDF, THV and CFE.

4. The article of claim 1, wherein said staple fibers further comprise a tortuous surface geometry or a trilobal surface geometry.

5. The article of claim 1 wherein the mass loading of catalyst particles within the article is at least 250 g/m^2.

6. The article of claim 1, wherein said water wettable, high temperature staple fibers comprise polyimide, polyamide, polyaramid, polyphenylene sulfide or fiberglass.

7. The article of claim 1, wherein said high temperature fluoropolymer scrim comprises PTFE.

8. The article of claim 1, further comprising a microporous layer attached to at least a portion of the porous substrate by at least one of laminating, welding, sewing, tacking and clamping.

9. The article of claim 8, wherein the microporous layer comprises expanded PTFE membrane.

10. The article of claim 8, wherein the microporous layer is on the upstream side of the porous substrate, within the porous substrate, or on the downstream side of the porous substrate.

11. The article of claim 10, wherein the microporous layer is a first microporous layer, and further comprising a second microporous layer on one of the upstream or downstream side of the porous substrate opposite the first microporous layer.

12. The article of claim 1, wherein the porous substrate and at least one microporous layer are arranged in the form of a filter bag comprising an inner filter bag and an outer filter bag arranged around the inner filter bag in a two-bag system.

13. A filter for use in a fluid stream comprising:

at least one porous substrate comprising at least one porous layer of water wettable, high temperature staple fibers felted onto a high temperature fluoropolymer scrim, said substrate having a plurality of catalyst particles adhered to the surface thereof by a polymer adhesive, wherein the catalyst particles are tethered to said substrate by polymer adhesive string.

14. The filter of claim 13, wherein the catalyst particles are selected from the group consisting of Pt, Pd, Au, Rh, Fe, Cu, Al, and compounds and combinations thereof, and vanadium oxide, on particles selected from the group consisting of titanium oxides, aluminum oxides, silica and zeolite.

15. The filter of claim 13, wherein the catalyst particles comprise at least one composition selected from the group consisting of vanadium oxide on metal oxide particles and platinum on metal oxide particles, and further comprising a microporous layer attached to at least a portion of the at least one porous substrate by at least one of lamination, welding, sewing, tacking and clamping.

16. The filter of claim 13, wherein the at least one porous layer comprises non-woven polyimide fibers needled onto the PTFE scrim, and wherein the catalyst particles comprise V_2O_5 on particles of anatase titanuim dioxide.

17. An article comprising:

a first porous substrate;

a second porous substrate; and

a woven scrim positioned between and attached to said first and second porous substrates,

wherein said first and second substrates comprise wettable, high temperature staple fibers,

wherein at least one of said first porous substrate and said second porous substrate have catalyst particles adhered to the surface thereof by a polymer adhesive, and

wherein said catalyst particles are tethered to said polymer adhesive by polymer strings.

18. The article of claim 17, wherein said first and second substrates are fibrous batts and wherein said batts are entangled with said scrim.

19. The article of claim 17, further comprising a microporous layer affixed to a side of said first substrate opposite said woven scrim.

20. The article of claim 17, wherein the adhesive further comprises dispersion primary polymer particles.