20. The method of claim **18**, wherein said slurry has a viscosity of at least about 4000 (cP).

21. The method of claim **18**, wherein the step of distributing said slurry includes the step of heating said layer on said surface at a preselected temperature for a time sufficient to remove said solvent and form a "green" film layer prior to calcining said layer.

22. The method of claim **11**, wherein said slurry includes an organic binder.

23. The method of claim **22**, wherein said organic binder is dissolved in a solvent that includes a polymer.

24. The method of claim **23**, wherein said polymer in said solvent is polyvinyl butyral mixed in carbitol acetate.

25. The method of claim **11**, wherein said slurry includes at least one binder particle.

26. The method of claim **25**, wherein said at least one binder particle includes a material selected from the group consisting of: a metal; a polymer; a ceramic; an oxide, a metal oxide; and combinations thereof.

27. The method of claim **26**, wherein said at least one binder particle is a metal oxide particle selected from the group consisting of: alumina; titania; zirconia; magnesia; and combinations.

28. The method of claim **11**, wherein the step of calcining said layer includes use of an annealing temperature selected in the range from about 350° C. to about 950° C. that forms a thermally stable film on said surface.

29. The method of claim **11**, wherein the step of calcining said layer includes use of an annealing temperature of about 550° C. that forms a thermally stable film on said surface.

30. The method of claim **11**, wherein the step of calcining said layer includes use of an annealing temperature of about 650° C. that forms a thermally stable film on said surface.

31. The method of claim **11**, wherein the step of functionalizing said thin film includes use of an organosilane self-assembly material or process in a supercritical fluid.

32. The method of claim **11**, wherein the step of functionalizing said thin film includes use of a tethered functionalizing ligand selected from the group consisting of: thiols, carboxylates, sulfonates, phosphonates, amines, phosphines, ammonium salts, phosphonium salts, and combinations thereof, said ligand selectively binds to and concentrates a preselected analyte from a fluid when contacted by said analyte.

33. A method of using a porous thin film to preconcentrate a preselected analyte, comprising the step of:

contacting said porous thin film affixed to a preselected substrate with a fluid or a gas that contains said preselected analyte;

said film is comprised of silica particles of a generally uniform distribution having a multimodal pore size distribution and an open interface functionalized with a ligand that selectively binds to said analyte;

whereby said analyte is preconcentrated in said film in contact with said fluid or said gas.

34. The method of claim **33**, further including the step of: determining said analyte preconcentrated in said film using a preselected analytical process or instrument.

35. The method of claim **34**, wherein said analytical process or instrument is an XRF process or instrument.

36. The method of claim **35**, wherein said substrate that includes said film is a planar support of glass, alumina, or alumina.

37. The method of claim **35**, wherein said film provides a detection limit for determination of said analyte in said fluid or said gas at a concentration that is lower than can be directly analyzed with said instrument.

38. The method of claim **35**, wherein said film provides detection of said analyte at a parts-per-billion level in said fluid or said gas.

39. The method of claim **33**, wherein said film is used as a component of a sampling and analysis system or device.

40. The method of claim **33**, wherein said film is used as a component of a sensor or a sensor system.

* * * * *