CLAIMS

WHAT IS CLAIMED IS:

1. A solid support suitable for performing affinity chromatography comprising

i) a silica particle having a pore size greater than 630Å and less than 1000Å and a mean silica particle size greater than 50~~55~~µm and less than 70µm~~.~~, and

ii) an affinity ligand linked to the solid support wherein the affinity ligand is selected from the group consisting of proteins, enzymes, antibodies, immunoglobulins, and protein receptors and the affinity ligand density is 12g/L to 14 g/L.

2. The solid support of claim 1, wherein the silica particle is a bead.

3. The solid support of claim 1, wherein the silica particle has a pore size ranging from 782Å to 932Å.

4. The solid support of claim 1, wherein the silica particle has a mean particle size ranging from 55 µm to 67 µm.

5. The solid support of claim 1, wherein the silica particle is comprised of a material chosen from particulate glass, controlled porous glass, colloidal silica, wollastonite, dried silica gel and bentonite.

~~6. The solid support of claim 1 further comprising an affinity ligand linked to the solid support.~~

~~7.~~6. The solid support of claim ~~6~~1, wherein the affinity ligand density is ~~greater than 10g/L~~ 13g/L.

~~8.~~7. The solid support of claim ~~6~~1, wherein the dynamic capacity of the affinity ligand for a target molecule is ~~greater than or equal to 49g/L~~ 50 g/L to 60 g/L.

~~9.~~8. The solid support of claim ~~6~~1, wherein the affinity ligand specifically binds to a portion of an immunoglobulin.

~~10.~~9. The solid support of claim ~~9~~8, wherein the affinity ligand binds to a portion of an Fc region of an immunoglobulin.

~~11.~~10. The solid support of claim ~~9~~8, wherein the affinity ligand is chosen from Protein A, Protein G or a functional variant of either.

~~12. A controlled porous glass bead comprising a pore size of about 839Å; a mean particle size of 63 µm and an affinity ligand comprising Protein A or a functional variant thereof linked to the bead.~~

~~13. A controlled porous glass bead comprising a pore size of about 700Å; a mean particle size of 55 µm ± 13um and an affinity ligand comprising Protein A or a functional variant thereof linked to the bead.~~

~~14. A method of isolating a target molecule comprising: a) contacting a mixture containing the target molecule with an affinity chromatography matrix where the matrix comprises 1) a solid support comprising a silica particle having a pore size greater than 630Å and less than 1000Å and a mean particle~~

~~size greater than 55µm and less than 70µm and 2) an affinity ligand having specificity for the target molecule linked to the solid support; and optionally b) eluting the target molecule from the affinity chromatography matrix.~~

~~15. The method of claim 14, wherein the affinity chromatography matrix is contained in a housing and the contacting step comprises running the mixture containing the target molecule over the affinity chromatography matrix at a maximum flow rate ranging from 600 cm/hour to 900 cm/hour.~~

~~16. The method of claim 14, wherein the target molecule comprises at least a portion of an immunoglobulin.~~

~~17. The method of claim 14, wherein the target molecule comprises a monoclonal antibody or a polyclonal antibody.~~

~~18. The method of claim 14, wherein the target molecule comprises a fusion protein comprising at least a portion of an Fc region of an immunoglobulin.~~

~~19. The method of claim 14, wherein the affinity ligand comprises Protein A or a functional variant thereof.~~

~~20. The method of claim 14, wherein the affinity ligand is coupled to the silica particle at a density of 10g/L or greater.~~

~~21. The method of claim 14, wherein the target molecule is eluted from the~~

~~affinity chromatography matrix with a buffer having an acidic pH.~~

~~22. The method of claim 14, wherein the affinity chromatography matrix has a dynamic binding capacity for the target molecule of at least 45 g/liter.~~

~~23.~~11. A kit comprising an affinity chromatography solid support comprising a silica particle having a pore size greater than 630Å and less than 1000Å and a mean particle size greater than 55µm and less than 70µm, an affinity ligand linked to the solid support having an affinity ligand density from greater than 15 g/L, and a dynamic capacity for a target molecule 50 g/L to 60 g/L, wherein the affinity ligand is selected from the group consisting of proteins, enzymes, antibodies, immunoglobulins, and protein receptors, and at least one container.

~~24. The kit of claim 23 further comprising an affinity ligand suitable for linking to the solid support.~~

~~25.~~12. The kit of claim ~~23~~11, further comprising a column suitable for packing the affinity chromatography solid support .

13. A solid support suitable for performing affinity chromatography comprising

i) a silica bead selected from the group consisting of a particulate glass, controlled porous glass, colloidal silica, wollastonite, dried silica gel and bentonite, having a pore size from about 782 Å to 932 Å and a mean particle size from about 55 µm to 67 µm, and

ii) an affinity ligand, having an affinity ligand density from 12g/L to 14g/L, linked to the solid support wherein the affinity ligand is selected from the group consisting of proteins, enzymes, antibodies, immunoglobulins, and protein receptors,

wherein the affinity ligand has a dynamic capacity for a target molecule at least 50 g/L.

14. A kit comprising an affinity chromatography solid support and a column suitable for packing the affinity chromatography solid support,

the affinity chromatography solid support comprises a silica particle having a pore size greater than about 782 Å to 932 Å and a mean particle size from 55 µm to 67 µm, an affinity ligand linked to the solid support having an affinity ligand density from 12 g/L to 14 g/L, and a dynamic capacity for a target molecule 50 g/L to 60 g/L, wherein the affinity ligand is selected from the group consisting of proteins, enzymes, antibodies immunoglobulins, and protein receptors, and at least one container.