

WHAT IS CLAIMED IS:

1. A magnetic particle for processing a sample solution, the magnetic particle comprising:
 - a magnetic material having a maximum field strength in a range of from about 20 emu/g to about 250 emu/g and a remanence in a range of from about 0 emu/g to about 30 emu/g; and
 - an outer surface containing a ligand, wherein the ligand interacts with an analyte of interest in the sample solution.
2. The magnetic particle of claim 1, wherein the magnetic material comprises ferrimagnetic material.
3. The magnetic particle of any one of claims 1 or 2, wherein the magnetic material comprises Fe_2TiO_2 , FeTiO_2 , MnFe_2O_4 , NiFe_2O_4 , MgFe_2O_4 , Fe_7S_8 , Fe_3S_4 , FeS , or FeOOH .
4. The magnetic particle of any one of claims 1-3, wherein the ligand is a capture reagent comprising a thiol group, streptavidin, an amine group, a hydroxyl group, a tosyl group, an epoxy group, an alkyl group, a vinyl group, an aryl group, an enzyme, a protein, a deoxyribonucleic acid, a ribonucleic acid, an immunoglobulin G, a carboxyl group, or a monoclonal antibody.
5. The magnetic particle of any one of claims 1-4, wherein the ligand comprises a carboxyl group.
6. The magnetic particle of any one of claims 1-5, wherein the maximum field strength is in a range of from about 35 emu/g to about 100 emu/g.
7. The magnetic particle of any one of claims 1-6, wherein the remanence is in a range of from about 0 emu/g to about 10 emu/g.
8. A method of processing a sample, the method comprising:

providing a magnetic particle having a ligand on a surface of the particle, wherein the ligand selectively interacts with an analyte of interest in the sample, the magnetic particle having a maximum field strength in a range of from about 20 emu/g to about 250 emu/g and a remanence in a range of from about 0 emu/g to about 30 emu/g; and

contacting a solution comprising the analyte of interest with the magnetic particle to allow the ligand to interact with the analyte of interest.

9. The method of claim 8, further comprising subjecting the magnetic particle to a magnetic field, thereby allowing the magnetic particle to be separated from the solution.

10. The method of any one of claims 8 or 9, wherein the analyte of interest is a nucleic acid.

11. The method of any one of claims 8-10, wherein the maximum field strength is in a range of from about 35 emu/g to about 100 emu/g.

12. The method of any one of claims 8-11, wherein the remanence is in a range of from about 0 emu/g to about 10 emu/g.

13. The method of any one of claims 8-12, wherein the magnetic particle comprises ferrimagnetic material.

14. The method of any one of claims 8-13, wherein the magnetic particle comprises Fe_2TiO_2 , FeTiO_2 , MnFe_2O_4 , NiFe_2O_4 , MgFe_2O_4 , Fe_7S_8 , Fe_3S_4 , FeS , or FeOOH .

15. The method of any one of claims 8-14, wherein the ligand is a capture reagent comprising a thiol group, streptavidin, an amine group, a hydroxyl group, a tosyl group, an epoxy group, an alkyl group, a vinyl group, an aryl group, an enzyme, a protein, a deoxyribonucleic acid, a ribonucleic acid, an immunoglobulin G, a carboxyl group, or a monoclonal antibody.