Claims

What is claimed is:

1. A self-assembling packer for use downhole in a wellbore, comprising:

a tubing section containing a carrier fluid comprising a polymer precursor and magnetically responsive particles, wherein the polymer precursor comprises a material that forms cross-links and cures;

one or more magnets positioned on or within the tubing section, the one or more magnets bordering a space and creating a radially extending magnetic field; a component to cause deployment of the carrier fluid into the space to be filled;

wherein a magnetic field from the one or more magnets is operable for directing the carrier fluid to fill the space.

2. The self-assembling packer of claim 1, further comprising a component on the tubing section to contain the carrier fluid until deployment.

3. The self-assembling packer of claim 2, wherein the component on the tubing section to contain the carrier fluid until deployment comprises a rupture disc.

4. The self-assembling packer of claim 1, wherein the carrier fluid creates a self-assembling packer upon cure of the polymer precursor.

5. The self-assembling packer of claim 1, wherein the carrier fluid is a sealant.

6. The self-assembling packer of claim 1, wherein the polymer precursor of the carrier fluid comprises at least one of a plastic, adhesive, thermoplastic, thermosetting resin, elastomeric material, polymer, epoxy, silicone, sealant, oil, gel, glue, acid, thixotropic fluid, dilatant fluid, or any combination thereof.

7. The self-assembling packer of claim 1, wherein the magnetically responsive particles comprise nanoparticles.

8. The self-assembling packer of claim 1, wherein the magnetically responsive particles comprise at least one of iron, nickel, cobalt, diamagnetic particles, paramagnetic particles, or any combination thereof.

9. The self-assembling packer of claim 1, wherein the carrier fluid comprises a silicone and wherein the magnetically responsive particles comprise iron nanoparticles.

10. The self-assembling packer of claim 1, wherein the one or more magnets comprise ring magnets.

11. The self-assembling packer of claim 1, wherein the one or more magnets comprise two series of bar magnets that are secured to or within the tubing section, one series of bar magnets adjacent to a first side of the component on the tubing section to contain the carrier fluid until deployment, and a second series of bar magnets adjacent to a second side of the component on the tubing section to contain the carrier fluid until deployment.

12. The packer of claim 3, wherein the rupture disc comprises rupture disc comprises at least one of foil, metal, a dissolvable plug, a temperature sensitive plug, a shape memory plug, a plug that shrinks or enlarges at a certain environmental condition, or a combination thereof.

13. The packer of claim 1, wherein the component to cause deployment comprises a pressure delivering component.

14. The packer of claim 13, wherein the pressure delivering component comprises a piston.

15. The packer of claim 1, wherein the carrier fluid is delivered through a conduit and further comprising a shunt between the conduit and at least one of the one or more magnets.

16. A method for constraining a sealant to create a downhole packer, comprising:

providing a radially extending magnetic force field from a tubing section; providing a magnetorheological fluid with a carrier component that cures to form a sealant;

dispensing the magnetorheological fluid such that the magnetorheological fluid is constrained by the magnetic force field,

allowing the fluid to cure to form a packer,

wherein the carrier component comprises a polymer precursor.

17. Use of a magnetorheological fluid comprising a polymer precursor and magnetically responsive particles, wherein the polymeric precursor is delivered downhole as two separate components into a downhole environment, wherein mixing of the two separate components downhole forms a carrier fluid, and wherein movement of the carrier fluid is constrained by a radially extending force field.

18. The use of claim 17, wherein the force field is provided by one or more magnets.

19. A method for isolating different zones in a downhole formation, comprising:

creating a self-assembling polymeric packer as defined by claim 1.