

What is claimed is:

1. A catheter comprising polymer tubing, wherein at least a portion of the polymeric tubing comprises a magnetized portion, wherein the magnetized portion is magnetized to produce a known magnetic field B at a distance x through tissue of permeability μ_r .
2. The catheter according to claim 1, wherein the magnetized portion includes a magnetized composition comprising a magnetic material dispersed in a polymer.
3. The catheter according to claim 2, wherein the wherein the magnetized composition forms a magnetized layer on the polymeric tubing is a magnetized outer layer surrounding a non-magnetizable inner layer.
4. The catheter according to claim 1, wherein the magnetized portion forms magnetized longitudinal segments between an inner surface and an outer surface of the tubing, wherein the magnetized longitudinal segments are separated by longitudinal non-magnetizable segments.
5. The catheter according to claim 4, wherein the magnetized portion comprises a magnetized composition.
6. The catheter according to claim 4, wherein the magnetized portion comprises magnetized wires co-formed with the polymeric tubing.
7. The catheter according to any one of claims 1 to 6, wherein the magnetized portion further comprises a radiopaque component.
8. The catheter according to claim 7, wherein the radiopaque component is selected from the group consisting of barium sulfate, bismuth subcarbonate, bismuth oxychloride, bismuth trioxide, tungsten and mixtures thereof.
9. The catheter according to any one of claims 1 to 8, wherein the magnetic material is dispersed uniformly within the at least a portion of the polymer.
10. The catheter according to any one of claims 1 to 9, wherein the magnetic material is selected from the group consisting of powdered iron; magnetic iron oxide; magnetic titanium oxide; magnetic powdered steel; magnetic iron alloys; paramagnetic or ferromagnetic compounds containing one of chromium, magnesium, and molybdenum; and mixtures thereof.

11. The catheter according to claim 10, wherein the magnetic iron alloy is an alloy with nickel, zinc, and/or copper.
12. The catheter according to any one of claims 1 to 11, wherein the magnetic material in the magnetized composition is less than 15% (w/w) of the polymer, less than 10% (w/w) of the polymer, or less than 5% (w/w) of the polymer.
13. A vascular access device comprising the polymeric catheter according to any one of claims 1 to 12, the polymeric catheter having a proximal end and a distal end, the device further comprising:

a catheter adapter and a needle cannula disposed with the polymeric catheter, the magnetized portion of the polymeric catheter having a magnetic field that is detectable by a magnetometer.
14. An ultrasound system comprising the vascular access device according to claim 13, further comprising a 3-dimensional array of magnetometers.
15. The system of claim 14, wherein the location of the magnetized portion with respect to the 3-dimensional array of magnetometers is determined by $I=f(B_i \mu_r)$, where $i= x$ or y or z along three axes.