Claims

1. A method of performing a chemical reaction, comprising reacting a mixture of reactants in the presence of a catalyst, wherein the catalyst comprises:

   a fiber substrate; and

   a plurality of nanowires attached to the fiber substrate, wherein the plurality of nanowires are comprised of at least one noble metal selected from the group consisting of gold (Au), silver (Ag), palladium (Pd), platinum (Pt), iridium (Ir), osmium (Os), rhodium (Rh), and ruthenium (Ru).

2. The method of claim 1, wherein the plurality of nanowires are coated with a different noble metal selected from the group consisting of Au, Ag, Pd, Pt, Ir, Os, Rh, and Ru.

3. The method of claim 1 or 2, wherein the fiber substrate is comprised of a material selected from the group consisting of glass, silica, alumina, titania, strontium titanium oxide, lanthanum aluminum oxide, calcium carbonate, silicon, paper, and polymer.

4. The method of any one of claims 1 to 3, wherein the plurality of nanowires are comprised of Au.

5. The method of any one of claims 1 to 4, wherein the fiber substrate is comprised of glass.

6. The method of any one of claims 1 to 5, wherein a plurality of the catalysts are placed in a fixed bed column.

7. The method of claim 6, wherein the mixture of reactants is passed through the fixed bed column partially or completely packed with the plurality of catalysts.