What is claimed is:

1. A metal hydrazine composition comprising:

a purification medium comprising a support having a surface area in the range of 750–820 m^2/g and a pore volume in the range of 0.6–1.5 mL/g; and

a lithium hydrazine complex having the formula LiN_2H_3 associated with said purification medium, wherein said lithium hydrazine complex is formed by reaction of hydrazine (N_2H_4) with lithium amide ($LiNH_2$) associated with said support.

2. The metal hydrazine composition of claim 1, wherein said support is selected from the group consisting of Amberlite resin, carbon-based material, alumina, and silica.

3. The metal hydrazine composition of claim 2, wherein said support is Amberlite resin.

4. The metal hydrazine composition of claim 1, wherein said lithium hydrazine complex is reactive with water to form lithium hydroxide (LiOH) and hydrazine (N_2H_4).

5. The metal hydrazine composition of claim 1, wherein said purification medium comprises Alkali Metal Media formed by dispersing lithium amide ($LiNH_2$) on said support prior to exposure to hydrazine.

6. The metal hydrazine composition of claim 5, wherein said support is Amberlite resin.

7. The metal hydrazine composition of claim 1, wherein said lithium hydrazine complex is formed according to the reaction:

$LiNH_2 + N_2H_4 \rightarrow LiN_2H_3 + NH_3$.

8. The metal hydrazine composition of claim 7, wherein said lithium hydrazine complex reacts with water according to the reaction:

$LiN_2H_3 + H_2O \rightarrow LiOH + N_2H_4$.