Claims

1. A chalcogenide material having a composition of matter comprising:

selenium in an amount greater than or equal to 40% by weight, relative to a total weight of the composition;

arsenic in an amount ranging from 10% to 35% by weight, relative to the total weight of the composition;

thallium in an amount ranging from 0.15% to 35% by weight, relative to the total weight of the composition; and

silicon, wherein the composition comprises a combination of germanium, the silicon, and the thallium in an amount greater than or equal to 20% by weight, relative to the total weight of the composition, and

wherein the germanium is in an amount ranging from 1% to 20% by weight, relative to the total weight of the composition.

2. The chalcogenide material of claim 1, wherein the silicon is in an amount ranging from 1% to 15% by weight, relative to the total weight of the composition.

3. The chalcogenide material of claim 1, wherein the selenium is in an amount greater than or equal to 45% by weight, relative to the total weight of the composition.

4. The chalcogenide material of claim 1, wherein the arsenic is in an amount ranging from 12% to 32% by weight, relative to the total weight of the composition.

5. An apparatus, comprising:

a memory element, wherein the memory element has a composition comprising:

selenium in an amount greater than or equal to 40% by weight, relative to a total weight of the composition;

arsenic in an amount ranging from 10% to 35% by weight, relative to the total weight of the composition;

thallium in an amount ranging from 0.15% to 35% by weight, relative to the total weight of the composition; and

silicon, wherein the composition of the memory element comprises a combination of germanium, the silicon, and the thallium in an amount greater than or equal to 20% by weight, relative to the total weight of the composition, and

wherein the germanium is in an amount ranging from 1% to 20% by weight, relative to the total weight of the composition.

6. The apparatus of claim 5, wherein the composition of the memory element comprises:

the silicon in an amount ranging from 1% to 15% by weight, relative to the total weight of the composition.

7. The apparatus of claim 5, wherein the composition of the memory element comprises:

the selenium in an amount greater than or equal to 45% by weight, relative to the total weight of the composition.

8. The apparatus of claim 5, wherein the composition of the memory element comprises:

the arsenic in an amount ranging from 12% to 32% by weight, relative to the total weight of the composition.

9. The apparatus of claim 5, wherein the memory element comprises a self-selecting memory device.