What is claimed is:

1. A method comprising:

blending together nanometer and/or micrometer-sized particles that comprise M^1, M^2, M^3 and M^4 to produce a powder having a composition that comprises the formula (1):

$$M^1{}_aM^2{}_bM^3{}_cM^4{}_dO_{12} \quad (1)$$

where

O represents oxygen,

M^1, M^2, M^3, and M^4 represent a first, second, third, and fourth metal that are different from each other,

the sum of a+b+c+d is about 8, where

"a" has a value of about 2 to about 3.5,

"b" has a value of 2 to about 5,

"c" has a value of 1 to about 5, and

"d" has a value of 0.001 to about 1, where "b" and "c", "b" and "d", or "c" and "d" cannot both be equal to zero simultaneously,

M^1 is a rare earth element comprising gadolinium, yttrium, lutetium, scandium, or a combination of thereof,

M^2 is aluminum or boron,

M^3 is gallium, and

M^4 is a dopant and comprises one of thallium, copper, silver, lead, bismuth, indium, tin, antimony, tantalum, tungsten, strontium, barium, boron, magnesium, calcium, yttrium, scandium, lanthanum, lutetium, praseodymium, terbium, ytterbium, samarium, europium, holmium, dysprosium, erbium, thulium or neodymium;

heating the powder to a temperature of 500 to 2000° C to melt the powder; and

heating the melt to a temperature of 800 to 1700° C in an oxygen containing atmosphere to manufacture a crystalline scintillator; where the heating of the powder to a temperature of 500 to 2000° C to melt the powder is conducted prior to the heating of the melt to a temperature of 800 to 1700° C.

2. The method of claim 1, where for M^1, a portion of the gadolinium can be substituted with one or more of yttrium, lutetium, lanthanum, terbium, praseodymium, neodymium, samarium, europium, dysprosium, holmium, erbium, ytterbium, or combinations thereof.

3. The method of claim 1, where M^2 is aluminum.

4. The method of claim 1, where "a" has a value about 2.4 to about 3.2, "b" has a value of about 2 to about 3, "c" has a value of about 1 to about 4, and "d" has a value of about 0.001 to about 0.5.

5. The method of claim 4, where "a" has a value of about 3, "b" has a value of about 2.1 to about 2.5, "c" has a value of about 2 to about 3, and "d" has a value of about 0.003 to about 0.3.

6. The method of claim 1, where the blending is conducted in a ball mill or a roll mill.

7. The method of claim 1, where the powder has average particle sizes of 5 nanometers to 500 micrometers.

8. The method of claim 1, where the crystalline scintillator comprises a single crystal, a polycrystalline material or a combination thereof.

9. The method of claim 1, further comprises producing a single crystal scintillator by the Czochralski method, the Bridgman technique, the Kyropoulos technique, or the Verneuil technique from the crystalline scintillator.

10. An article manufactured by a method comprising:

manufacturing a powder having a composition of formula (1),

$$M^1{}_aM^2{}_bM^3{}_cM^4{}_dO_{12} \quad (1)$$

where

O represents oxygen,

M^1, M^2, M^3, and M^4 represents a first, second, third, and fourth metal that are different from each other,

the sum of a+b+c+d is about 8, where

"a" has a value of about 2 to about 3.5,

"b" has a value of 0 to about 5,

"c" has a value of 0 to about 5, and

"d" has a value of 0 to about 1, where "b" and "c", "b" and "d", or "c" and "d" cannot both be equal to zero simultaneously,

M^1 is a rare earth element comprising gadolinium, yttrium, lutetium, scandium, or a combination of thereof,

M^2 is aluminum or boron,

M^3 is gallium, and

M^4 is a dopant and comprises one of thallium, copper, silver, lead, bismuth, indium, tin, antimony, tantalum, tungsten, strontium, barium, boron, magnesium, calcium, yttrium, scandium, lanthanum, lutetium, praseodymium, terbium, ytterbium, samarium, europium, holmium, dysprosium, erbium, thulium or neodymium; and

heating the powder to a temperature of 500 to 2000° C to melt the powder;

heating the melt to a temperature of 500 to 1700° C in an oxygen containing atmosphere to manufacture a crystalline scintillator; where the heating of the powder to a temperature of 500 to 2000° C to melt the powder is conducted prior to the heating of the melt to a temperature of 800 to 1700° C.

11. The article of claim 10, where the article is used in an imaging device.