WHAT IS CLAIMED IS:

1. A spectral purity filter, comprising:

a body of material, through which a plurality of apertures extend, the apertures being arranged to suppress radiation having a first wavelength and to allow at least a portion of radiation having a second wavelength to be transmitted through the apertures, the second wavelength of radiation being shorter than the first wavelength of radiation;

the body of material comprising a material having a bulk reflectance of substantially greater than or equal to 70% at the first wavelength of radiation, and a melting point above 1000 °C.

2. The spectral purity filter of claim 1, wherein the material comprises one or more of: Cr, Fe, Ir, Mo, Nb, Ni, Os, Pt, Re, Rh, Ru, Ta, and W, or a silicide thereof.

3. The spectral purity filter of claim 1 or claim 2, wherein the material comprises an alloy of one or more of: Cr, Fe, Ir, Mo, Nb, Ni, Os, Pt, Re, Rh, Ru, Ta, and W, or a silicide thereof.

4. The spectral purity filter of claim 3, wherein the alloy comprises a majority amount by atomic weight of one or more of, or a combination of one or more of: Cr, Fe, Ir, Mo, Nb, Ni, Os, Pt, Re, Rh, Ru, Ta, and W, or a silicide thereof.

5. The spectral purity filter of any preceding claim, wherein the material further comprises a plurality of nanoparticles for increasing a re-crystallization temperature of the material as a whole.

6. The spectral purity filter of claim 5, wherein the nanoparticles comprise of one or more of: Al_2O_3, HfO_2, ZrO_2, Y_2O_3, MgO, La2O3, Ce_2O_3, SrO, and HfC.

7. The spectral purity filter of claim 5 or claim 6, wherein the nanoparticles are distributed in layers within the body of material.

8. The spectral purity filter of any preceding claim, wherein a face of the body of material through which the apertures extend comprises of, or is provided with, a region or

layer that is formed from substantially pure Cr, Fe, Ir, Mo, Nb, Ni, Os, Pt, Re, Rh, Ru, Ta, W, or a silicide thereof.

9. The spectral purity filter of claim 8, wherein the face, in use, is configured to face toward incident radiation comprising the first wavelength and/or the second wavelength.

10. The spectral purity filter of any preceding claim, wherein the body of material has a grain structure:

that is substantially equiaxed; and/or

in which an average grain size is smaller than a width of a wall defining an aperture, or smaller than a shortest distance between two adjacent apertures; and/or

in which an average grain size or diameter is less than 500nm, or less than 200nm.

11. A method of manufacturing a spectral purity filter, comprising:

using a lithography and etch process on a body of material provided on a substrate, to provide a plurality of apertures in that body of material, the apertures being arranged to, in use, suppress radiation having a first wavelength and to, in use, allow at least a portion of radiation having a second wavelength to be transmitted through the apertures, the second wavelength of radiation being shorter than the first wavelength of radiation;

releasing the body of material from the substrate, the body of material forming the spectral purity filter,

wherein the body of material comprises a material having a bulk reflectance of substantially greater than or equal to 70% at the first wavelength of radiation, and a melting point above 1000 °C.

12. A method of manufacturing a spectral purity filter, comprising:

forming a mold for reception of a body of material, the mold being shaped to provide a plurality of apertures in that body of material, the apertures being arranged to, in use, suppress radiation having a first wavelength and to, in use, allow at least a portion of radiation having a second wavelength to be transmitted through the apertures, the second wavelength of radiation being shorter than the first wavelength of radiation;

supplying the mold with the body of material;

removing the mold to leave the body of material, which forms the spectral purity filter;

wherein the body of material comprises a material having a bulk reflectance of substantially greater than or equal to 70% at the first wavelength of radiation, and a melting point above 1000 °C.

13. The method or spectral purity filter of any preceding claim, wherein the body of material is divided into a plurality of relatively thick layers by a plurality of relatively thin layers of a second material.

14. The method or spectral purity filter of claim 13, wherein the layers of the second material comprise:

B, C, Si, or an oxide, nitride or carbide of a constituent of the body of material; and/or

nanoparticles, comprising of one or more of: Al_2O_3, HfO_2, ZrO_2, Y_2O_3, MgO, La2O3, Ce_2O_3, SrO, and HfC.

15. The method of claim 11 or claim 12, wherein the body of material is provided in a manner which is interrupted periodically by an etch of the surface of the body of material.

What is claimed is:

1. A spectral purity filter, comprising:

a body of material, through which a plurality of apertures extend, the apertures suppressing radiation having a first wavelength and allowing at least a portion of radiation having a second wavelength to be transmitted through the apertures, the second wavelength of radiation being shorter than the first wavelength of radiation; and

the body of material comprising a material having a plurality of nanoparticles for increasing a re-crystallization temperature of the material.

2. A spectral purity filter, comprising:

a body of material, through which a plurality of apertures extend, the apertures suppressing radiation having a first wavelength and allowing at least a portion of radiation having a second wavelength to be transmitted through the apertures, the second wavelength of radiation being shorter than the first wavelength of radiation; and

the body of material comprising a material having a bulk reflectance of substantially greater than or equal to 70% at the first wavelength of radiation, and a melting point above 1000 °C,

wherein the material further comprises a plurality of nanoparticles for increasing a re-crystallization temperature of the material as a whole.

3. A spectral purity filter, comprising:

a body of material, through which a plurality of apertures extend, the apertures suppressing radiation having a first wavelength and allowing at least a portion of radiation having a second wavelength to be transmitted through the apertures, the second wavelength of radiation being shorter than the first wavelength of radiation;

wherein the body of material is formed by periodically interrupting an etch of a surface of the body of material.

4. The spectral purity filter of any one of claims 1-3, wherein the material comprises one or more of: Cr, Fe, Ir, Mo, Nb, Ni, Os, Pt, Re, Rh, Ru, Ta, and W, or a silicide thereof.

5. The spectral purity filter of any one of claims 1-4, wherein the material comprises an alloy of one or more of: Cr, Fe, Ir, Mo, Nb, Ni, Os, Pt, Re, Rh, Ru, Ta, and W, or a silicide thereof.

6. The spectral purity filter of claim 5, wherein the alloy comprises a majority amount by atomic weight of one or more of, or a combination of one or more of: Cr, Fe, Ir, Mo, Nb, Ni, Os, Pt, Re, Rh, Ru, Ta, and W, or a silicide thereof.

7. The spectral purity filter of claim 1 or 2, wherein the nanoparticles are comprised of one or more of: Al_2O_3, HfO_2, ZrO_2, Y_2O_3, MgO, La_2O_3, Ce_2O_3, SrO, and

HfC.

8. The spectral purity filter of claim 1 or 2, wherein the nanoparticles are distributed in layers within the body of material.

9. The spectral purity filter of any one of claims 1 to 8, wherein a face of the body of material through which the apertures extend is comprised of, or is provided with, a region or layer that is formed from substantially pure Cr, Fe, Ir, Mo, Nb, Ni, Os, Pt, Re, Rh, Ru, Ta, W, or a silicide thereof.

10. The spectral purity filter of claim 9, wherein the face, in use, faces toward incident radiation comprising the first wavelength and/or the second wavelength.

11. The spectral purity filter of any one of claims 1 to 10, wherein the body of material has a grain structure:

that is substantially equiaxed; and/or

in which an average grain size is smaller than a width of a wall defining an aperture, or smaller than a shortest distance between two adjacent apertures; and/or

in which an average grain size or diameter is less than 500nm, or less than 200nm.

12. The spectral purity filter of any one of claims 1 to 11, wherein the body of material is divided into a plurality of relatively thick layers by a plurality of relatively thin layers of a second material.

13. The spectral purity filter of claim 12, wherein the layers of the second material comprise:

B, C, Si, or an oxide, nitride or carbide of a constituent of the body of material; and/or nanoparticles, comprising one or more of: AI_2O_3, $Hf0_2$, $Zr0_2$, Y_2O_3, MgO, La_2O_3, Ce_20_3, SrO, and HfC.

14. A method of manufacturing a spectral purity filter, comprising:

using a lithography and etch process on a body of material provided on a substrate, to provide a plurality of apertures in that body of material, the apertures, in use, suppressing radiation having a first wavelength and, in use, allowing at least a portion of radiation having a second wavelength to be transmitted through the apertures, the second wavelength of radiation being shorter than the first wavelength of radiation; and

releasing the body of material from the substrate, the body of material forming the spectral purity filter,

wherein the body of material comprises a material having a plurality of nanoparticles for increasing a re-crystallization temperature of the material.

15. A method of manufacturing a spectral purity filter, comprising:

forming a mold for reception of a body of material, the mold being shaped to

provide a plurality of apertures in that body of material, the apertures, in use, suppressing radiation having a first wavelength and, in use, allowing at least a portion of radiation having a second wavelength to be transmitted through the apertures, the second wavelength of radiation being shorter than the first wavelength of radiation;

supplying the mold with the body of material; and

removing the mold to leave the body of material, which forms the spectral purity filter;

wherein the body of material comprises a material having a plurality of nanoparticles for increasing a re-crystallization temperature of the material.

16. The method of claim 14 or 15, wherein the body of material is divided into a plurality of relatively thick layers by a plurality of relatively thin layers of a second material.

17. The method-of claim 16, wherein the layers of the second material comprise:

B, C, Si, or an oxide, nitride or carbide of a constituent of the body of material; and/or nanoparticles, comprising one or more of: AI_2O_3, $Hf0_2$, $Zr0_2$, $Y2O_3$, MgO, $La203$, Ce_20_3, SrO, and HfC.

18. The method of any one of claims 14-17, wherein the body of material is formed by periodically interrupting an etch of the surface of the body of material.