CLAIMS

1. An identifiable mark (1210) on a portion of a polished facet (1200) of a surface of an article and being identifiable by an optical magnifying viewing device, said identifiable mark (1210) comprising:

   a nano-structure formed by a two-dimensional or a three-dimensional lattice of a plurality of discrete nanometer sized recessed or protruded entities (1220), wherein said entities (1220) are arranged within a predefined region of said polished facet (1200) in a predetermined arrangement in relation to each other, and such that an outer interface surface between the facet (1220) of the article and air is formed and an inner interface surface between the facet (1200) of the article and air is formed;

   wherein said predetermined arrangement of said entities (1220) is a non-uniform and non-periodic arrangement, and wherein said entities (1220) are sized and shaped so as to cause optical scattering upon reflection of incident light, and the distance from the inner interface surface to the outer interface surface is greater than the amplitude of the non-marked portion of said polished facet (1200);

   such that upon reflection of incident light, said incident light having one or more predetermined wavelengths by said lattice at a predetermined angle of incidence to said lattice, interference due to scattering of light from said lattice is induced, such that reflected light has a variation in intensity providing one or more local maxima of one or more wavelengths; and

   said mark (1210) is invisible to the naked eye and is invisible when utilizing a typical camera equipped microscope under normal light conditions and said mark (1210) is identifiable by way of an optical magnifying viewing device inclined at a requisite viewing angle and upon light of one of more wavelengths being scattered from the lattice of the mark(1210) such that a local maxima is detected and the mark (1210) is identifiable by one or more colours of said one or more wavelengths.

2. An identifiable mark according to claim 1, wherein said entities (1220) of said lattice are spaced apart in the range of from 10nm to 900nm, the discrete entities (1220) have a maximum lateral dimension in the range of from 1nm to 899nm, and the normal distance between the outer interface surface and the inner interface surface is in the range of from 1nm to 200nm.

3. An identifiable mark according to claim 1 or claim 2, wherein said two-dimensional or a three-dimensional lattice provides at least one identifiable mark (1210) having two or more colour features viewable by way of said optical magnification viewing device.

4. An identifiable mark according to any one of the preceding claims, wherein said non-marked portion of said facet (1200) has an average surface roughness less than about 1nm.

5. An identifiable mark according to any one of the preceding claims, wherein said variation in intensity is distinguishable by human eye or an optical camera from any reflected signal from the non-marked portion of said facet (1200).

6. An identifiable mark according to any one of the preceding claims, wherein the recessed or protruded entities (122) of said two-dimensional or a three-dimensional lattice are either regular or irregular shaped holes, dots, disks, pillars or the like, and may be provided as a circular arranged lattice, spiral arranged lattice, square arranged lattice, triangular arranged lattice, hexagonal arranged lattice, fractal arranged lattice, or multiple combination thereof.

7. An article having thereon an identifiable mark according to any one of claims 1 to 6.

8. An article according to claim 7, wherein said article is a gemstone, is selected from the group including Diamond, Ruby, Sapphire, Emerald, Pearl, Jade, Tourmaline or the like.

9. An article according to claim 7 or claim 8, wherein said lattice is provided in a region of about 400µm x 400µm on the polished facet (1200).

10. A method of providing the identifiable mark on a portion of a polished facet (1200) of a surface of an article and being identifiable by an optical magnifying viewing device, said method including the steps of:

    forming a nano-structure of a two-dimensional or a three-dimensional lattice of a plurality of discrete nanometer sized recessed or protruded entities (1220) on a portion of a facet of an article, wherein said entities (1220) are arranged within a predefined region of said facet (1200) in a predetermined arrangement in relation to each other, and such that an outer interface surface between the facet (1200) of the article and air is formed and an inner interface surface between the facet (1220) of the article and air is formed;

    wherein said predetermined arrangement of said entities (1220) is non-uniform and non-periodic arrangement, and wherein said entities (1220) are sized and shaped so as to cause optical scattering upon reflection of incident light, and the distance from the inner interface surface to the outer interface surface is greater than the amplitude of the non-marked portion of said polished facet (1200);

    such that upon reflection of incident light having one or more predetermined wavelengths by said lattice at a predetermined angle of incidence to said lattice, interference due to scattering of light from said lattice is induced, such that reflected light has a variation in intensity providing one or more local maxima of one or more wavelengths; and

    wherein said mark (1210) is invisible to the naked eye and is invisible when utilizing a typical camera equipped microscope under normal light conditions and is identifiable by way of an optical magnifying viewing device inclined at a requisite viewing angle and upon light of one of more wavelengths being scattered from the lattice of the mark (1210) such that a local maxima is detected and the mark (1210) is identifiable by one or more colours of said one or more wavelengths.

11. A method according to claim 10, wherein said two-dimensional or a three-dimensional lattice of nanometer sized discrete entities (1220) is formed from a nano-fabrication method, wherein said nano-fabrication method is a method including focused ion beam, a deep UV (ultraviolet) laser beam, wet chemical etching, ion plasma etching, different aspect ratio of shadow mask for plasma etch process or the like, or any combination thereof.

12. A method according to claim 10, wherein said two-dimensional or a three-dimensional lattice is formed by a focused ion beam and by way of dynamic control variation of the spot size and dose of the focused ion beam.

13. A method according to any one of claims 10 to 12, wherein said article is a gemstone, and wherein the gemstone is selected from the group including Diamond, Ruby, Sapphire, Emerald, Pearl, Jade, Tourmaline or the like.

14. An article having an identifiable mark (1200) formed on a portion of a polished facet (1200) of a surface of the article, wherein the identifiable mark (1200) is formed from the method according to any one of claim 10 to 13.

15. A method of viewing an identifiable mark (1200) on an article of any one of claims 7 to 9, said method including the steps of:

    providing incident light having one or more predetermined wavelengths at a predetermined angle of incidence to the identifiable mark (1200); and

    viewing said identifiable mark (1200) at said requisite viewing angle by way of an optical viewing device such that a local maxima is detected.