CLAIMS:

1. A light pattern exposure method comprising irradiating a pattern of light to a resist film through a photomask using ArF excimer laser light as the light source, wherein

the photomask used is such that it has been irradiated with ArF excimer laser light in a cumulative dose of at least 10 kJ/cm^2,

said photomask comprising a transparent substrate and a pattern of optical film of a material comprising a transition metal, silicon, and nitrogen and/or oxygen, the transition metal having potentially a valence of 6,

the contents of transition metal, silicon, nitrogen and oxygen in the optical film meeting both the formulae (1) and (2):

$$6\times C_M/100 - 4\times C_{Si}/100 \leq -0.89 \quad (1)$$

$$6C_M\times 3C_N/(6C_M\times 6C_M+6C_M\times 4C_{Si}+6C_M\times 3C_N+6C_M\times 2C_O+ 4C_{Si}\times 4C_{Si}+4C_{Si}\times 3C_N+4C_{Si}\times 2C_O) \geq 0.094 \quad (2)$$

wherein C_M is a transition metal content in atom%, C_{Si} is a silicon content in atom%, C_N is a nitrogen content in atom% and C_O is an oxygen content in atom%, except for an outermost surface region extending from the film surface remote from the substrate to a depth of 10 nm.

2. The method of claim 1 wherein the photomask has been treated for defect correction by directing a high-energy radiation beam in a fluorine base gas atmosphere.

3. The method of claim 1 ~~or 2~~ wherein the transition metal is molybdenum.

4. A photomask for use in a light pattern exposure method comprising irradiating a pattern of light to a resist film through the mask using ArF excimer laser light as the light source, said photomask being such that it may be irradiated with ArF excimer laser light in a cumulative dose of at least 10 kJ/cm^2,

said photomask comprising a transparent substrate and a pattern of optical film, the pattern being obtained by forming an optical film of a material comprising a transition metal, silicon, and nitrogen and/or oxygen on the substrate and patterning the film, the transition metal having potentially a valence of 6,

the contents of transition metal, silicon, nitrogen and oxygen in the optical film meeting both the formulae (1) and (2):

$$6\times C_M/100 - 4\times C_{Si}/100 \leq -0.89 \quad (1)$$

$$6C_M\times 3C_N/(6C_M\times 6C_M+6C_M\times 4C_{Si}+6C_M\times 3C_N+6C_M\times 2C_O+ 4C_{Si}\times 4C_{Si}+4C_{Si}\times 3C_N+4C_{Si}\times 2C_O) \geq 0.094 \quad (2)$$

wherein C_M is a transition metal content in atom%, C_{Si} is a silicon content in atom%, C_N is a nitrogen content in atom% and C_O is an oxygen content in atom%, except for an outermost surface region extending from the film surface remote from the substrate to a depth of 10 nm.

5. The photomask of claim 4 wherein the transition metal is molybdenum.

6. The photomask of claim 4 ~~or 5~~ wherein the transparent substrate is a silicon oxide substrate, and an etching

selectivity ratio of at least 4 is established between the optical film and the silicon oxide substrate.

7. A photomask blank from which a photomask is prepared, wherein the photomask is used in irradiating a pattern of light to a resist film using ArF excimer laser light as the light source, and the photomask may be irradiated with ArF excimer laser light in a cumulative dose of at least 10 kJ/cm^2,

said photomask blank comprising a transparent substrate and an optical film of a material comprising a transition metal, silicon, and nitrogen and/or oxygen, the transition metal having potentially a valence of 6,

the contents of transition metal, silicon, nitrogen and oxygen in the optical film meeting both the formulae (1) and (2):

$$6\times C_M/100 - 4\times C_{Si}/100 \leq -0.89 \quad (1)$$

$$6C_M\times 3C_N/(6C_M\times 6C_M+6C_M\times 4C_{Si}+6C_M\times 3C_N+6C_M\times 2C_O+ 4C_{Si}\times 4C_{Si}+4C_{Si}\times 3C_N+4C_{Si}\times 2C_O) \geq 0.094 \quad (2)$$

wherein C_M is a transition metal content in atom%, C_{Si} is a silicon content in atom%, C_N is a nitrogen content in atom% and C_O is an oxygen content in atom%, except for an outermost surface region extending from the film surface remote from the substrate to a depth of 10 nm.

8. The blank of claim 7 wherein the transition metal is molybdenum.

9. The blank of claim 7 ~~or 8~~ wherein the transparent substrate is a silicon oxide substrate, and an etching