CLAIMS:

1. A photomask blank which is processed into a photomask suitable for pattern transfer using exposure light of wavelength up to 250 nm, comprising a transparent substrate and a chromium-containing film which is disposed on the substrate directly or through an optical film and dry etchable with oxygen-containing chlorine based gas, wherein

said chromium-containing film is constructed by a single layer or multiple layers, the single layer or at least one of the multiple layers is a layer which is composed of a carbon-containing chromium compound and further contains oxygen or oxygen and nitrogen,

said layer composed of a carbon-containing chromium compound and further containing oxygen or oxygen and nitrogen has a composition having an atomic ratio of carbon to chromium of at least 0.3 and an atomic ratio of nitrogen to chromium of up to 0.1, and having a chromium content of up to 50 at% and an atomic ratio of carbon to oxygen of at least 0.8, or a chromium content of up to 60 at% and an atomic ratio of carbon to oxygen of at least 1.

2. The photomask blank of claim 1 wherein said layer composed of a carbon-containing chromium compound and further containing oxygen or oxygen and nitrogen has an oxygen content of at least 20 at%.

3. The photomask blank of claim 1 or 2 wherein the surface of the chromium-containing film disposed remote from the substrate has a root mean square roughness (RMS) of up to 1 nm and a maximum height difference (Rmax) of up to 9 nm, as analyzed on any area of 1 μm squares by surface profile measurement under atomic force microscope.

4. The photomask blank of any one of claims 1 to 3 wherein the chromium-containing film has a thickness of up to 70 nm.

5. The photomask blank of any one of claims 1 to 4 wherein the chromium-containing film has an optical density of at least 1.5 with respect to the exposure light.

6. The photomask blank of any one of claims 1 to 5 wherein the chromium-containing film is constructed by multiple layers

7. The photomask blank of claim 6 wherein the chromium-containing film is constructed by multiple layers, the layer of the chromium-containing film which is disposed remotest from the substrate is a layer composed of a carbon-free chromium compound.

8. The photomask blank of claim 7 wherein the layer composed of a carbon-free chromium compound contains nitrogen or nitrogen and oxygen and has a nitrogen content of at least 5 at% and a thickness of 1 to 5 nm.

9. The photomask blank of claim 8 wherein the layer composed of a carbon-free chromium compound contains nitrogen and oxygen and has a chromium content of up to 50 at% and a nitrogen content of at least 40 at%.

10. The photomask blank of any one of claims 1 to 9 wherein the chromium-containing film is disposed on the transparent substrate through the optical film, and the optical film includes a phase shift film formed of a material containing silicon, but not a transition metal or a material containing silicon and a transition metal.

11. The photomask blank of claim 10 wherein the sum of optical densities of the chromium-containing film and the phase shift film with respect to the exposure light is at least 2.5.

12. The photomask blank of any one of claims 1 to 11, further comprising a hard mask film of silicon-containing material on the chromium-containing film.

13. A method for producing a photomask from the photomask blank of any one of claims 1 to 12, comprising the step of patterning the chromium-containing film of the photomask blank by oxygen-containing chlorine based dry etching.