CLAIMS

[Claim 1] A chemical solution comprising:

a pH adjusting agent;

at least one oxidizing agent selected from the group consisting of metaperiodic acid, sodium metaperiodate, orthoperiodic acid, sodium orthoperiodate, permanganic acid, permanganate, and N-methylmorpholine N-oxide; and

at least one selected from the group consisting of ruthenium, cerium, and ions thereof, in an amount of 0.0001 molar equivalent to 10 molar equivalent with respect to the oxidizing agent,

wherein the pH adjusting agent is an organic base or an inorganic base.

[Claim 2] The chemical solution according to claim 1, wherein a pH of the chemical solution is 10 or higher and 16 or lower.

[Claim 3] The chemical solution according to claim 1, wherein the pH adjusting agent is sodium hydroxide or potassium hydroxide.

[Claim 4] The chemical solution according to claim 1, wherein the oxidizing agent is metaperiodic acid, sodium metaperiodate, orthoperiodic acid, or sodium orthoperiodate.

[Claim 5] The chemical solution according to claim 1, wherein the oxidizing agent is permanganic acid or permanganate.

[Claim 6] The chemical solution according to claim 1, further comprising an aminocarboxylic acid-based chelating agent, a hydroxy acid-based chelating agent, or a phosphonic acid-based chelating agent as a chelating agent.

[Claim 7] A method of regenerating a film-formed substrate comprising:

bringing a film-formed substrate having a multilayer reflective film containing silicon and molybdenum formed on one surface of a glass substrate into contact with a chemical solution containing a pH adjusting agent and at least one oxidizing agent selected from the group consisting of metaperiodic acid, sodium metaperiodate, orthoperiodic acid, sodium orthoperiodate, permanganic acid, permanganate, and N-methylmorpholine N-oxide; and

removing at least the multilayer reflective film from the glass substrate to regenerate a surface of the glass substrate on which the multilayer reflective film was formed.

[Claim 8] The method of regenerating a film-formed substrate according to claim 7, wherein the film-formed substrate has a protective film containing ruthenium on the multilayer reflective film.

[Claim 9] The method of regenerating a film-formed substrate according to claim 7, wherein the film-formed substrate has an absorption film containing at least one selected from the group consisting of ruthenium, tantalum, niobium, and boron on the multilayer reflective film.

[Claim 10] The method of regenerating a film-formed substrate according to claim 7, wherein the film-formed substrate has a conductive film containing chromium or tantalum on a surface opposite to a surface on which the multilayer reflective film is formed.

[Claim 11] A method of manufacturing a film—formed substrate comprising, forming a multilayer reflective film containing at least silicon and molybdenum on one surface of the glass substrate regenerated by the method of regenerating the film-formed substrate of any one of claims 7 to 10.

[Claim 12] A method of manufacturing a multilayer reflective mask blank comprising:

forming the multilayer reflective film containing silicon and molybdenum on one surface of the glass substrate regenerated by the method of regenerating the film-formed substrate of any one of claims 7 to 10;

forming a protective film containing ruthenium or rhodium on the multilayer reflective film;

forming an absorption film containing at least one selected from the group consisting of ruthenium, tantalum, chromium, iridium, boron, niobium, rhenium, and palladium on the protective film; and

forming a conductive film containing at least one selected from the group consisting of chromium, tantalum, and boron on a surface of the glass substrate opposite to the surface on which the multilayer reflective film is formed.