WHAT IS CLAIMED IS:

1. A protective film to be disposed on a surface of a workpiece, wherein the protective film is formed from a protective film agent including a water-soluble resin and a light absorbing agent, and the protective film has a hardness in a range from 0.0093 GPa to 0.13 GPa.

2. A protective film agent comprising:

a water-soluble resin;

a light absorbing agent;

a plasticizer; and

a solvent in which the water-soluble resin, the light absorbing agent, and the plasticizer are dissolved, wherein

a ratio of a mass of the plasticizer to a mass of the water-soluble resin is in a range from 15% to 53%, and a protective film formed from the protective film agent has a hardness in a range from 0.0093 GPa to 0.13 GPa.

3. The protective film agent according to claim 2, wherein

the water-soluble resin is at least one selected from a group consisting of polyvinyl alcohol, a vinyl acetate-vinyl pyrrolidone copolymer, and polyvinyl

pyrrolidone, and

the plasticizer is trimethylol propane.

4. The protective film agent according to claim 2, wherein the solvent includes water, and a ratio of a mass of water to a mass of the protective film agent is 50% or more.

5. A method of processing a workpiece, comprising:

a covering step of covering a surface of the workpiece with a protective film formed from a protective film agent including a water-soluble resin and a light absorbing agent, the protective film having a hardness in a range from 0.0093 GPa to 0.13 GPa;

after the covering step, an irradiating step of irradiating the protective film along projected processing lines established on the workpiece with a pulsed laser beam having a wavelength absorbable by the protective film, thereby removing portions of the protective film along the projected processing lines to expose portions of the workpiece; and,

after the irradiating step, a plasma etching step of performing plasma etching on the exposed portions of the workpiece using the protective film as a mask.

6. The protective film according to claim 1, wherein the protective film agent further contains a plasticizer

and a solvent in which the water-soluble resin, the light absorbing agent and the plasticizer are dissolved, and wherein a ratio of a mass of the plasticizer to a mass of the water-soluble resin is in a range of 15% to 53%.

7. The method of processing a workpiece according to claim 5, wherein the protective film agent further contains a plasticizer and a solvent in which the water-soluble resin, the light absorbing agent and the plasticizer are dissolved, and wherein a ratio of a mass of the plasticizer to a mass of the water-soluble resin is in a range of 15% to 53%.