Glass Cloudiness

When glass appears cloudy, it can be divided into two phenomena: 1) "Weathering" and 2) "Alkali Corrosion."

1) Weathering

Weathering is a phenomenon in which alkaline components [Na (sodium), Ca (calcium)] in glass react with moisture in the air that condenses due to temperature changes during storage, producing alkaline hydroxides [NaOH, $Ca(OH)_2$], which then react with carbon dioxide in the air to produce compounds such as sodium carbonate ($Na2CO_3$) and calcium carbonate ($CaCO_3$). The cloudiness, dirty-looking white substance is actually grown crystals of these compounds. Weathering can be removed using the following method.

＊Left: Glass tumbler without weathering Right: Glass tumbler with weathering

How to remove weathering

(1) Dissolve 1 teaspoon of citric acid in 200 ml of water (warm water).

(2) Soak glass in citric acid water for a while.

(3) Take out the glass and wash it with regular dishwashing liquid.

(4) Wipe it with a cloth before it dries.



*Please follow the description regarding the concentration of citric acid water and the soaking time.
*If you do not follow it, the glass may be damaged and new cloudiness may occur.

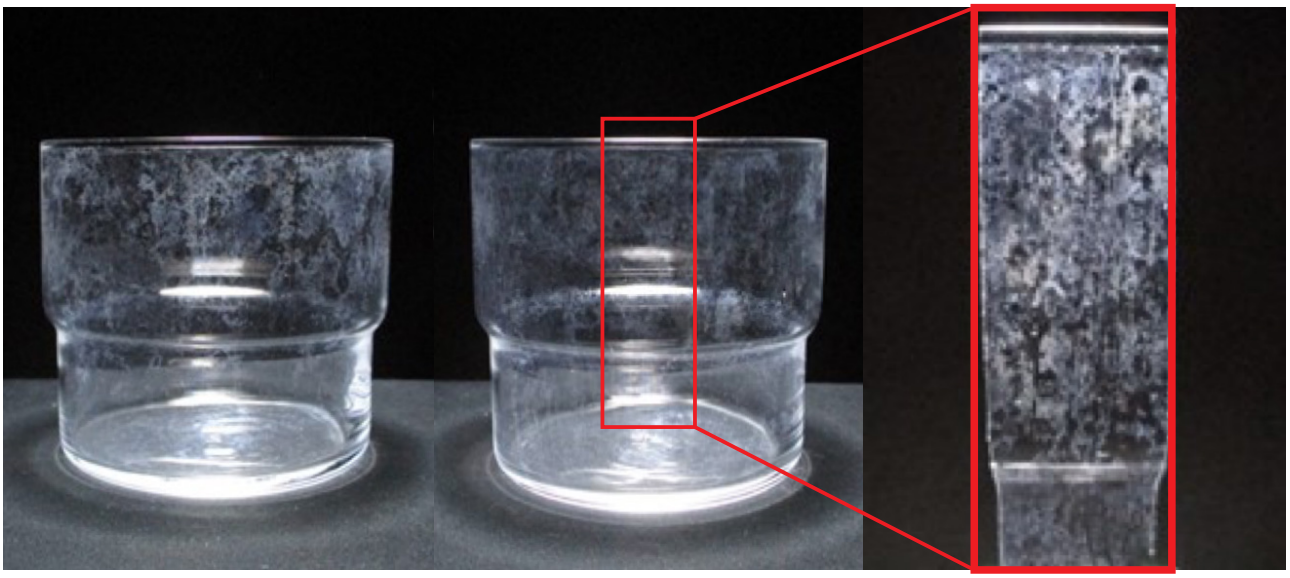
Preventive Measures for Weathering

The degree of weathering varies depending on the glass composition and environmental conditions. There are limits to what can be done with glass composition. Therefore, minimizing changes in environmental conditions is considered the most effective way to prevent weathering. However, controlling changes in environmental conditions is quite difficult, and as long as there are seasonal changes and temperature differences, it is difficult to prevent weathering from occurring. Therefore, the only effective countermeasure available is to avoid long-term storage. Please rest assured that the substances sodium carbonate and calcium carbonate that are generated are in trace amounts and are not harmful to the human body.

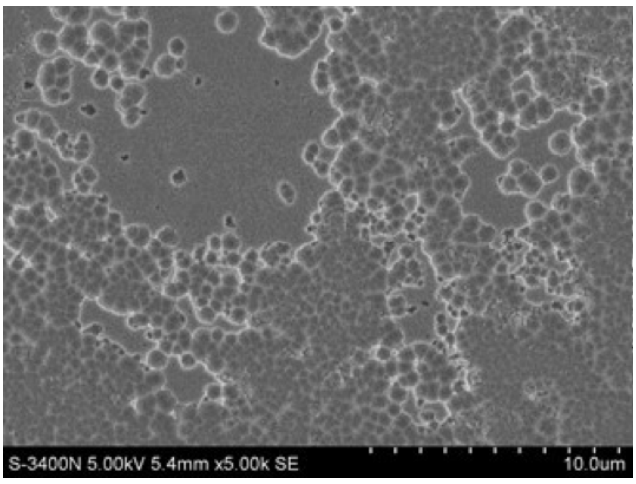
2) Alkali Corrosion

Alkaline corrosion is a phenomenon in which the glass surface is corroded by the alkaline detergent used in dishwashers, causing it to appear cloudy. Ordinary glass is corroded by the alkaline components in the detergent used in dishwashers. If this corrosion occurs unevenly, causing unevenness on the glass surface, alkaline corrosion will occur, causing the glass to appear cloudy. Once a product has been corroded, the cloudiness will not disappear no matter how much washing is done.

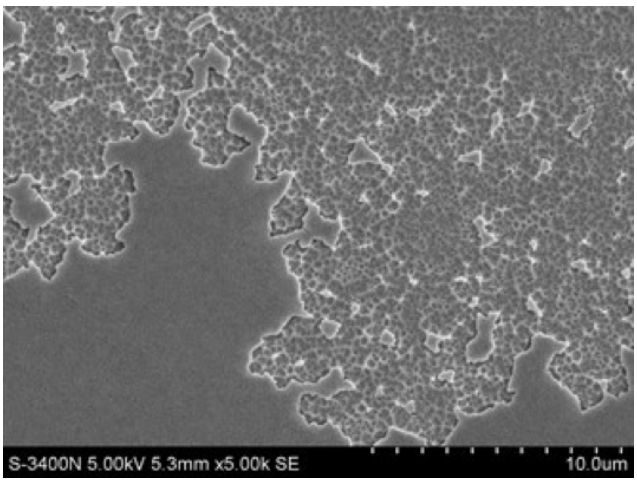
＊An example of glass whose surface has been corroded by alkaline detergent, resulting in a cloudy appearance. (The photo was taken in a darkroom with overhead lighting, making it appear even cloudier.)



＊The surface of alkali-corroded glass, observed under an electron microscope. The cloudy appearance of the sample is due to the unevenness of the inner and outer glass surfaces scattering light.



Inner glass surface



Outer glass surface

Preventing Alkaline Corrosion

The occurrence of alkaline corrosion varies depending on the frequency of use, the type of beverages consumed, and the type of food served with the dish.

To prevent alkaline corrosion,

1) We recommend regularly scrubbing with a soft sponge soaked in neutral kitchen detergent to remove any stains that cannot be removed in the dishwasher.

2) When using a dishwasher, be sure to rinse thoroughly to remove any residual alkaline detergent.
3) When using a commercial dishwasher, we recommend using a washing rack designed specifically for glassware. Also, be sure to use a washing rack that is the right size for the glassware. If the rack's partitions are too narrow, thorough cleaning will be hindered, resulting in cloudy surfaces.

Please note that once alkaline corrosion has occurred on a product, it will not disappear no matter how much cleaning is done. Please avoid rubbing the product too hard in an attempt to remove the corrosion, as this may cause scratches and damage, and may even lead to unexpected injury.