

# Alexis Templeton Studio

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## How Did Those Crystals Get There?

A ceramic glaze is essentially a layer of glass fired onto the surface of a clay body. How, then—if window glass doesn't have crystals—have magical shapes bloomed on the surface of these pots? Through the use of artifice and science—and after much experimentation!

In nature, crystals often form when a solution cools. Salt and snowflakes are examples of crystals that formed during cooling. Not all solutions make crystals when they cool, however—and glass is one that doesn't. (In fact, although it appears solid and homogenous, window glass is actually a very slow-moving liquid.) The secret to generating crystals in the glass fired onto the surface of these pots is in the glaze recipe, and in the manipulation of the cooling process.

Every glaze recipe contains silica (the basic ingredient of glass) and “fluxes”—elements that lower the temperature at which the silica melts. Common fluxes include calcium (whiting) and magnesium carbonate (which is found in talc). Glaze ingredients are in powdered form. To be used, they are measured, mixed with water, and applied to the surface of bisque-fired (once-fired) pottery. The pots are then “fired” in the kiln once again. As the kiln temperature rises, the ingredients in the glaze melt together. When the temperature is lowered, the glaze re-solidifies.

By adding the zinc oxide (as a flux) to the glaze recipe, and stalling the cooling process at specific temperatures, a potter can stimulate crystal growth. Why? Because when the glaze liquefies, the zinc oxide binds to the silica and the resulting “seeds” give the glaze a foundation, or lattice, on which it can solidify in a regular pattern as it cools—instead of its usual random form.

How is the cooling manipulated? Once the glaze is melted (at 1250°C), the temperature in the kiln is lowered quickly to 1100°C. The glaze becomes thicker and starts to “heal over,” just as a pond freezes in winter, but it's still soft enough to allow crystals to grow. Depending on the desired effects, the temperature is held between 1000° and 1100°C for two to six hours.

According to *The Complete Guide to High-fire Glazes* by John Britt, crystalline glazes have been used since people first began firing pottery, but “macro-crystalline glazing”—the stimulation of large crystal growth—is much more recent. It developed between 1849 and 1885, during extensive research at the Sèvres factory in France.

With experience, a potter can influence the shape and size of the crystals—but there is always an element of surprise. As the authors of *The Potter's Dictionary of Materials and Techniques* (Frank and Janet Hamer) note: crystalline effects require infinite patience and very accurate weighing, glaze application, firing, cooling, and note-keeping—of recipes and firing/cooling schedules. “A change of 1% of any of the constituents gives a different result, hence the need for patience.”

In her work with crystalline glazes, Alexis Templeton explores and integrates the cool blues, greens, and brilliant whites of two of Newfoundland's essential natural elements—the water and ice that grace our island. Ice crystals decorating window panes, icebergs floating past our coastlines, ponds freezing over again and again . . . the liquid/crystal form is deeply familiar and enduringly fascinating.