



Measuring pH and TDS of Curling Ice

Description

Curling likely began as a leisurely past time of sliding stones over ice, but has developed into a popular sport, earning a place in the Olympics. Rather than on frozen lochs or lakes, now it is played in indoor rinks, with official rules. Curling is a game played with two teams, each comprised of four people. A 44 pound (20 kg) granite stone is pushed along ice towards a target at the end of a rink. Curling is often referred to as the “roaring game” because of the sound the granite makes as it passed over the ice.

The characteristics of the ice used for curling are very important, as well as the water used for pebbling. Pebbling is when water is sprinkled over the ice surface, causing it to freeze in tiny bumps on the surface. Pebbling is done to aid in the stone gripping the ice, and provides a consistent surface for the sport. The friction created is essential to the sport: If pebbling was not performed, the stone would not travel down the ice due to the limited contact between a flat ice surface and the concave bottom of the curling stone. Pebbling reduces the friction between the stone and the ice; the ice pebbles melt slightly as the stone runs over them creating a thin layer of water for the stone to travel over.

The sweepers who sweep the ice in front of the stone use specific techniques that also cause the ice to melt a certain way. This is what causes the curling stone to spin, travel further, and straighter. As the game continues and pebbles begin to wear away sweepers need to compensate for this.

When creating a surface for a curling event consistency is important. Pure, neutral ice is desired, so water is often treated before being used for ice. Treatments can include carbon filters, water softeners, or deionizers. The water being used is then tested for purity by measuring dissolved solids and pH.

The existing ice is leveled with a laser, shaving parts down if needed, and then it is painted with curling markings. After this foam is placed around the rink and it is flooded with the treated water. Once this water freezes the ice is shaved again until it is perfectly flat. Then, the ice is ready for pebbling. Pebbling techniques and preferences differ from one ice maker to the next. A finished surface can have very fine or coarse pebbles depending on the ice maker. A common pebbling technique is to lay two layers on the ice. The first layer of water is at room temperature; the second layer is water that has been heated over 38°C. The heated water layer provides taller pebbles than the room temperature layer. As the taller pebbles wear away the first layer is exposed ensuring pebbles are present to finish the game. This process is repeated before each match.

Application

An avid curler contacted Hanna Instruments about testing the pH and total dissolved solids (TDS) of the water they used for pebbling. They wanted to be sure the deionized water they were using was below pH 7, above this the ice quality diminishes because it freezes slower. By measuring the TDS they would be able to verify

the dissolved solids were low enough, below 10ppm, for effective pebbling. After speaking to an inside sales representative, the **HI9813-5** portable pH, EC, TDS, and temperature meter was suggested since both measurements could be taken with one probe. The customer was also pleased to learn the meter can also report temperature in the ranges he desired, 32°C for the first layer and up to 50°C for his second layer of pebbling. The HI9813-5 features a polypropylene body housing the pH, temperature, and EC sensors making it durable for use in different rinks. The easy one point calibration ensured all readings were accurate, within 0.1 unit for pH, 1ppm for TDS, and 0.5°C for temperature. This portable meter was a great fit for our customer giving him the accuracy, ranges, and parameters he desired.

