

Supercooling state

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Supercooling state

It is a state that temperature of liquid falls below its freezing point, but liquid does not freeze. Water freezes when its temperature becomes 0 °C. However, the water in this state does not turn into ice even though temperature of the water goes down 0 °C. It starts freezing when it is given impetus such as dropping a small piece of ice into it.

Procedure

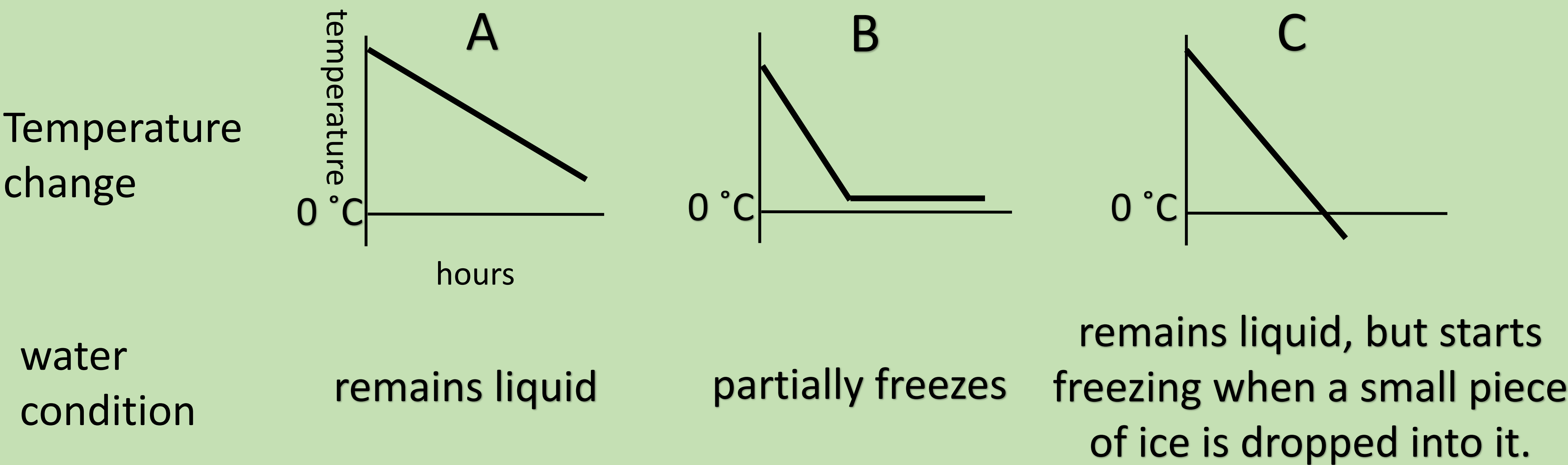
1. Salt is added to ice and stirred.
2. A cup with water is put in the ice.
3. The water temperature is measured.
4. The cup is taken out and the water condition is observed.



Examined factors

1. The constituent parts of water
2. The quantity of water

The tendency of temperature change and water condition



The effect of quantity and constituent parts

Tap water

water			water		
trial	quantity (ml)	result	trial	quantity (ml)	result
1	120	C	12	100	B
2	140	C	13	50	AorB
3	150	AorB	14	50	B
4	100	AorB	15	60	C
5	100	C	16	30	C
6	200	C	17	50	AorB
7	200	C	18	35	C
8	300	AorB	19	80	C
9	250	AorB	20	60	B
10	250	B	21	100	B
11	200	B	22	60	C

Ion exchange water

water			water		
trial	quantity (ml)	result	trial	quantity (ml)	result
1	80	C	9	80	B
2	120	B	10	200	AorB
3	120	C	11	150	C
4	120	C	12	150	C
5	120	B	13	50	C
6	120	B	14	200	C
7	120	B	15	200	B
8	80	C			

	tap water	ion exchange water
less than 100 ml	56 %	75 %
more than 100 ml	38 %	45 %
whole	45 %	53 %

Considerations

- The ion exchange water became supercooling state easily. So, it is suggested that ions in water become the core to freeze water.
- The small quantity of water (less than 100 ml) is likely to become supercooling state. It is expected when water quantity is large, temperature difference tends to occur and causes water to freeze.