- A Study on Supercooling of Acetic Acids -

Supercooling is the process of lowering the temperature of a liquid below its freezing point without it becoming a solid.

< Purpose >
Learn basic knowledge about supercooling.

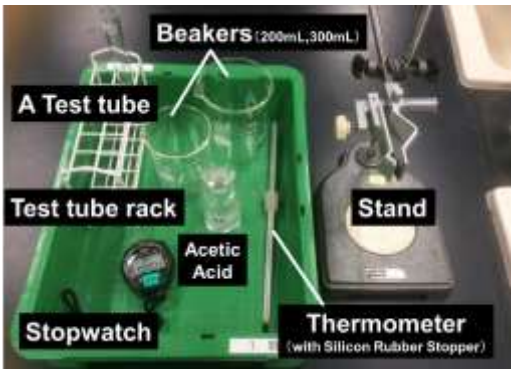
Preparations

(1) Materials

Glacial acetic acid (Strong odor!), Water, Ice

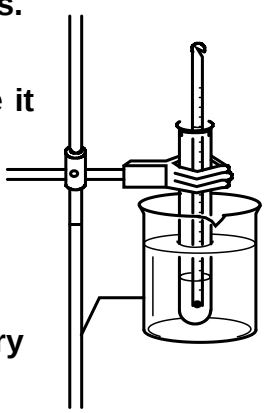
(2) Equipment

A Test tube, Test tube rack,
Thermometer (with Silicon Rubber Stopper),
Stopwatch, Beakers, Stand,
Glasses (Protective Eye Wear)



☐Procedure

① **Pour 10 mL of Glacial acetic acid (CH_3COOH) in a test tube.**
② **Measure the temperature of CH_3COOH and write it down in Table 1.**
③ **Prepare ice water in a beaker.**
④ **Soak the test tube (prepared in ①) in the iced water (prepared in ②).**
⇒ **Measure the temperature of CH_3COOH every ten seconds.**
⇒ **Observe the CH_3COOH in the test tube carefully.**
⑤ **When the temperature of CH_3COOH goes down to 5 °C, take it out of the beaker and flick the bottom of the test tube.**
⑥ **See if anything happens to the CH_3COOH, then measure the temperature of CH_3COOH every ten seconds until the temperature is kept at a constant value.**
⑦ **Heat the solid CH_3COOH up to 30 °C with a hot water and re-try the same experiment if you have time.**



☐Results

(1) Record the temperature changes of CH_3COOH.

Table 1

Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)
0		60		120		180		240		300		360		420	
10		70		130		190		250		310		370		430	
20		80		140		200		260		320		380		440	
30		90		150		210		270		330		390		450	
40		100		160		220		280		340		400		460	
50		110		170		230		290		350		410		470	

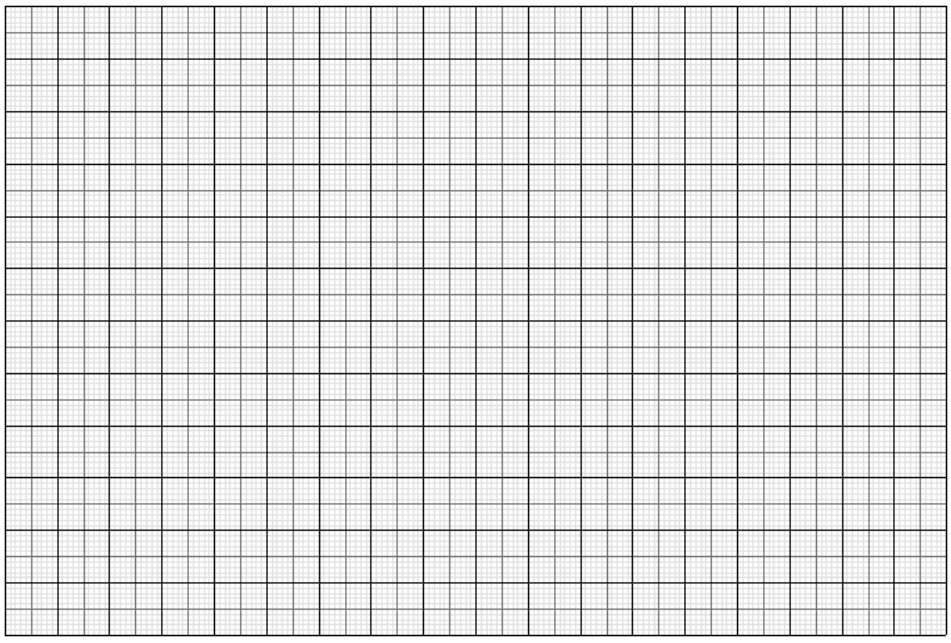
Table 2

Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)
0		60		120		180		240		300		360		420	
10		70		130		190		250		310		370		430	
20		80		140		200		260		320		380		440	
30		90		150		210		270		330		390		450	
40		100		160		220		280		340		400		460	
50		110		170		230		290		350		410		470	

Table 3

Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)	Time (s)	Temp. (℃)
0		60		120		180		240		300		360		420	
10		70		130		190		250		310		370		430	
20		80		140		200		260		320		380		440	
30		90		150		210		270		330		390		450	
40		100		160		220		280		340		400		460	
50		110		170		230		290		350		410		470	

(2) Record your temperature change results (Table1,2 and 3) in a graph.



☐Give us your feedback

Grade: Class: Number: Name