Deductive reasoning exercise: Solution Properties

Five grams of sucrose, ethanol, methanol, calcium chloride and aluminum chloride have been dissolved separately, each in 200.0 mL of water.there solutions were then placed randomly in the following containers:

250 mL beaker – $CaCl_2$ – A
250 mL Erlenmeyer flask - methanol – C
600 mL beaker – sucrose – E
500 mL Erlenmeyer flask - ethanol – B
1 L Florence flask – largest – D – $AlCl_3$

The containers were then labeled A-E randomly.

It is your task to determine each container's label and contents based upon the following clues:

The solution in the largest container has the highest boiling point. $AlCl_3$ is in the 1L F.F.
The sugar solution is in the largest beaker. sucrose is in the 600mL Beaker.
Erlenmeyer flasks hold volatile solutes. ethanol and methanol are in EMs.
Solution A is made with an ionic solid = $AlCl_3$ OR $CaCl_2$
Solutions labeled with vowels are in beakers. A & E are beakers.
The compound with the lowest molar mass is in the smallest flask. methanol is in the 250;
The solution with the lowest freezing point is C – methanol
The solute container B is a common gasoline additive - ethanol

	mm	i	volatile	i.m	F.P.	B.P.
sucrose	342.30	1	no	0.073		
ethanol	46.08	1	yes	0.543		—
methanol	32.05	1	yes	0.780	lowest	—
$CaCl_2$	110.98	3	no	0.676		
$AlCl_3$	133.33	4	no	0.750		highest