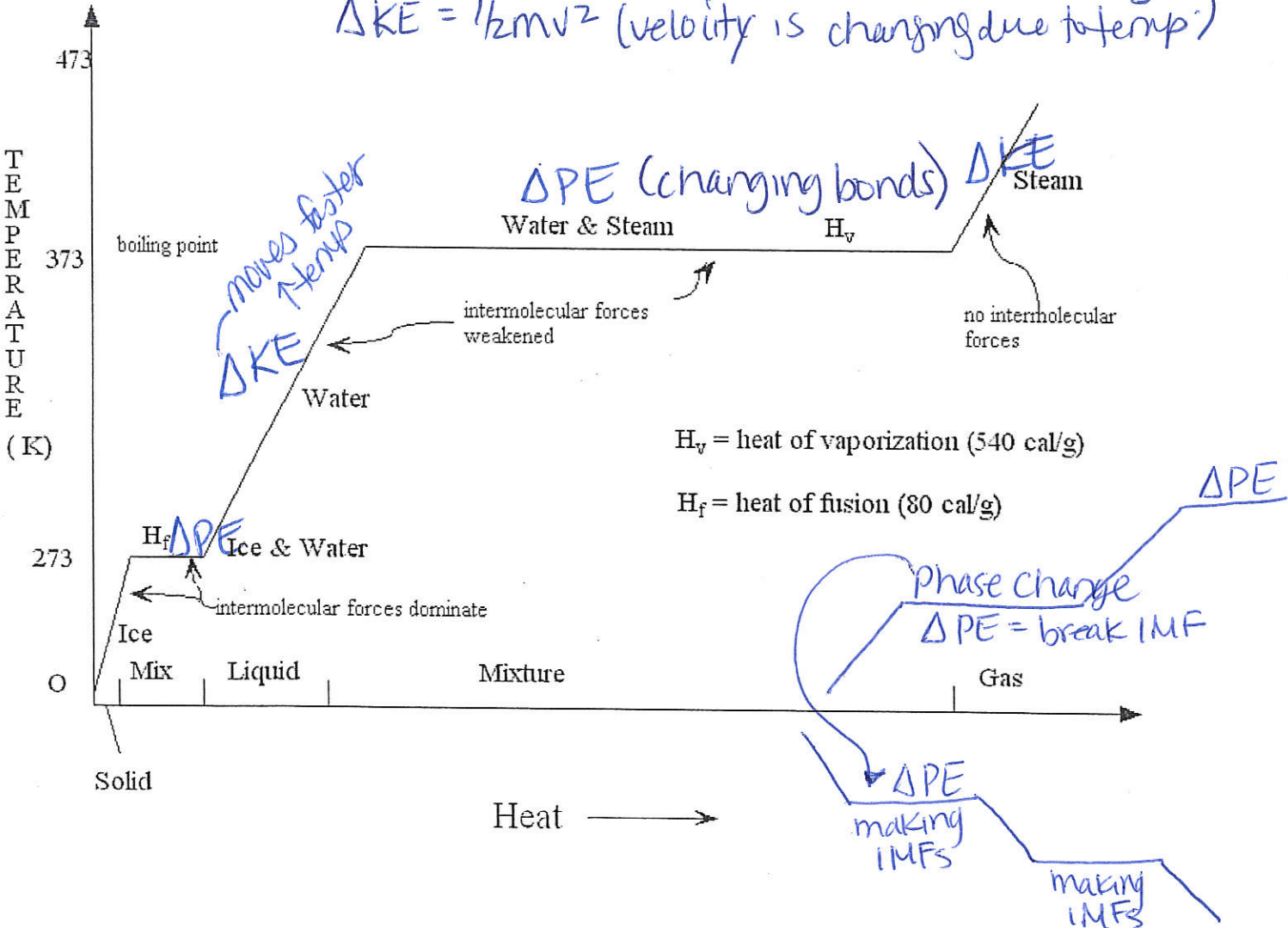


Forces Behavior

Phase Change Diagram for Water

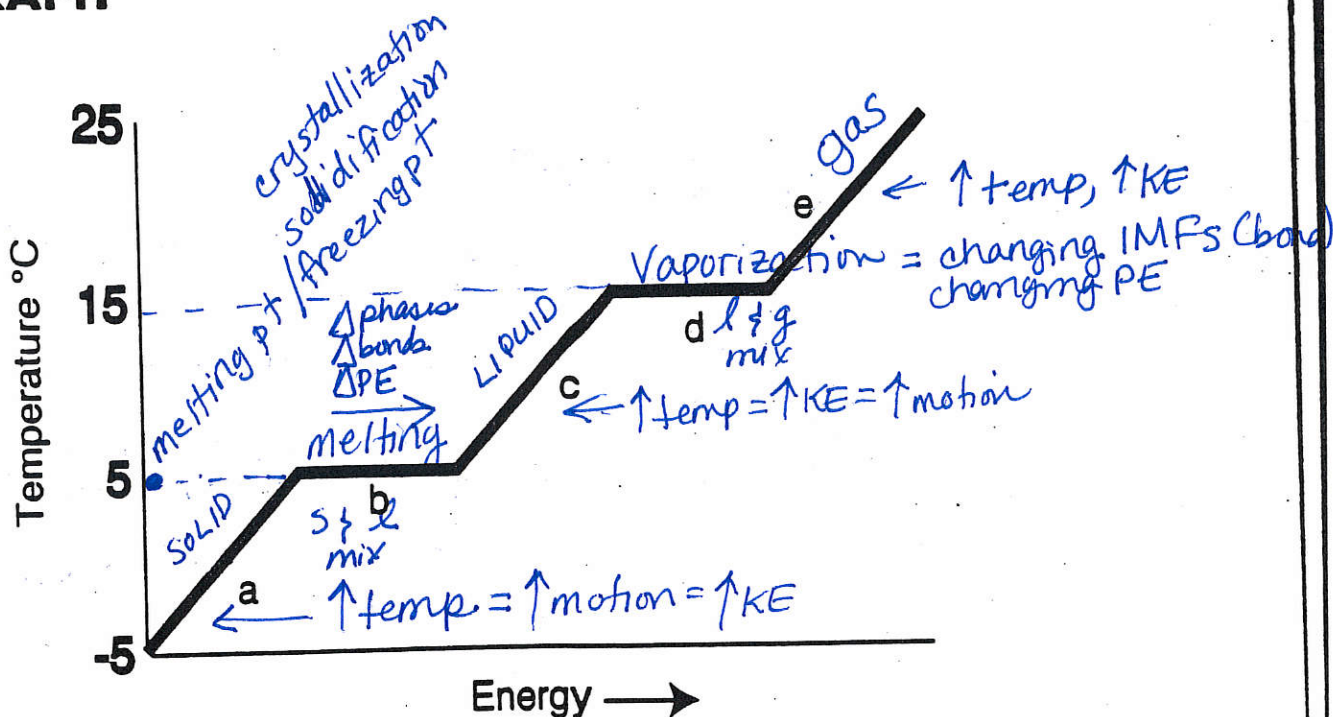
$\Delta PE =$  no temp change because energy is going into breaking bonds = heating  
making bonds = cooling

$\Delta KE = \frac{1}{2}mv^2$  (velocity is changing due to temp)



# FREEZING AND BOILING POINT GRAPH

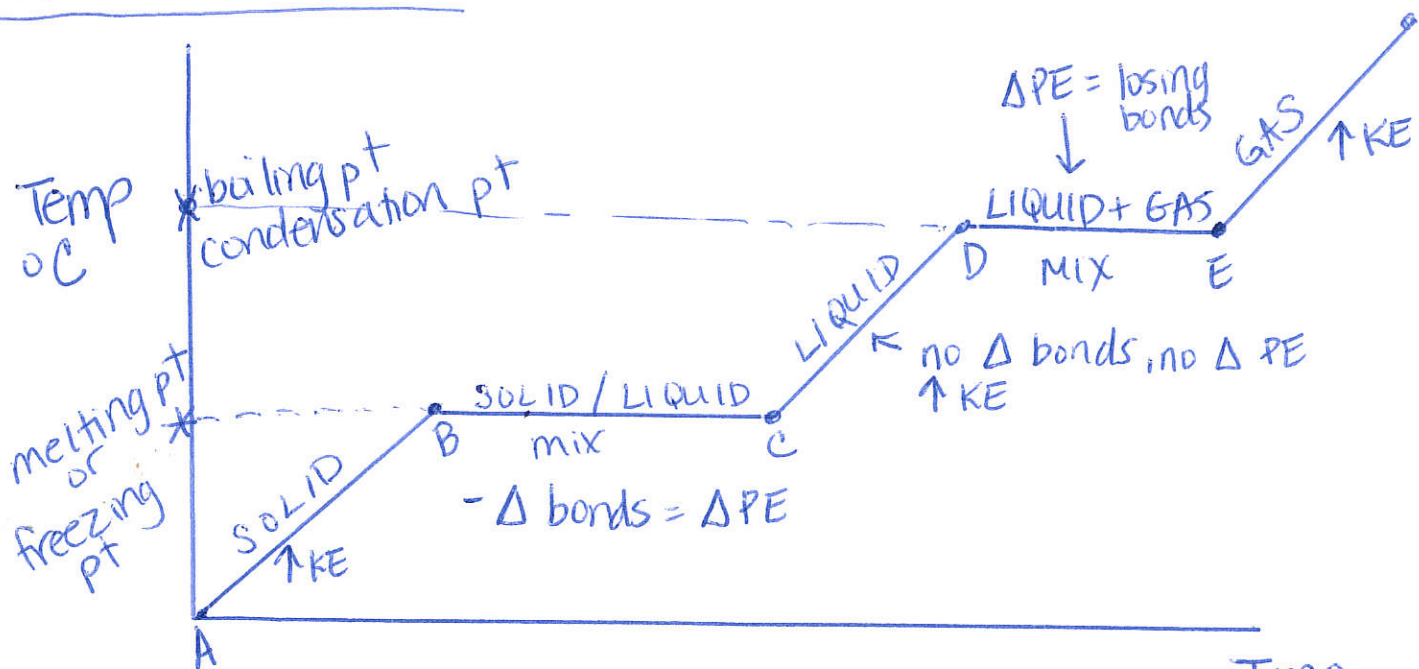
Name \_\_\_\_\_



Answer the following questions using the chart above.

1. What is the freezing point of the substance? 5
2. What is the boiling point of the substance? 15
3. What is the melting point of the substance? 5
4. What letter represents the range where the solid is being warmed? a
5. What letter represents the range where the liquid is being warmed? c
6. What letter represents the range where the vapor is being warmed? e
7. What letter represents the melting of the solid? b
8. What letter represents the vaporization of the liquid? d
9. What letter(s) shows a change in potential energy? b, d \* either breaking or making IMF (bonds)
10. What letter(s) shows a change in kinetic energy? a, c, e  $\Delta KE = \Delta \text{motion} = \Delta \text{temp}$
11. What letter represents condensation? d
12. What letter represents crystallization? b

# Phase Notes con't



$\overline{AB}$ : warming solid;  $\uparrow$  KE

Time  
(min)

$\overline{BC}$ : melting solid; KE is being used to break IMFs  
KE is not raising temp.

$\overline{CD}$ : warming liquid; KE is being used to move faster  
KE =  $\uparrow$  temp  
KE is not changing IMFs

$\overline{DE}$ : Vaporization pt  
mix l + g PE changing = changing bonds  
KE is being used to break IMFs  
KE is not raising temp!

$\overline{EF}$ : warming vapor  
 $\uparrow$  KE, because Temp  $\uparrow$  = causing motion of molecules  $\uparrow$