

Lecture 16 CH101 A1 (MWF 9:05 am) Fall 2017 Copyright © 2016 Dan Dill dan@bu.edu

[TP] The correct order of **polarity** of HBr, HCl and HI is (least to most) ...

17% 1. HBr < HCl < HI
 17% 2. HBr < HI < HCl
 17% 3. HCl < HBr < HI
 17% 4. HCl < HI < HBr
 17% 5. HI < HCl < HBr
 17% 6. HI < HBr < HCl

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Response Counter 10 1

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 Friday, October 13, 2017

For today ...

- Dipole-dipole versus temporary dipole attraction (dispersion)
- Putting it all together: Relative boiling points

Next lecture: Practice: Intermolecular forces; Dissolving ionic solids; solubility rules (memorize solubility guidelines fig 6.28, p 181); precipitation reactions; concentrations after precipitation; ionization of molecular solutes; self-ionization of water

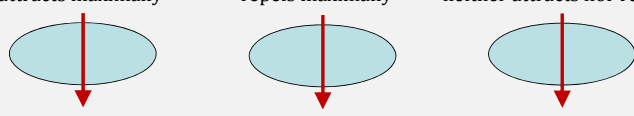
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Permanent dipoles

Sketch a second molecule arranged so that it ...

attracts maximally repels maximally neither attracts nor repels

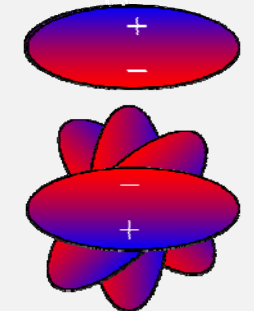


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Dipole can be attractive or repulsive

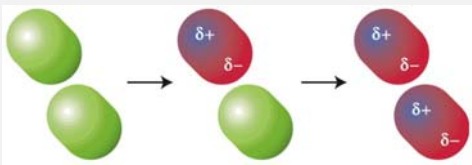


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Dispersion forces are due to induced dipoles



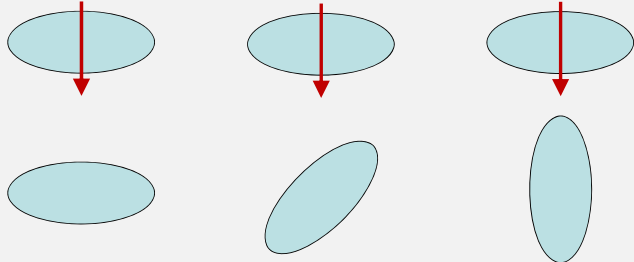
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Induced dipoles

Sketch the induced dipole in each case:

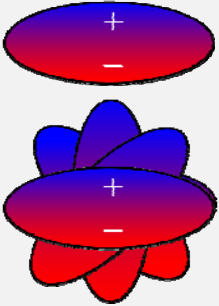


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Dispersion always attractive



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Relative boiling points

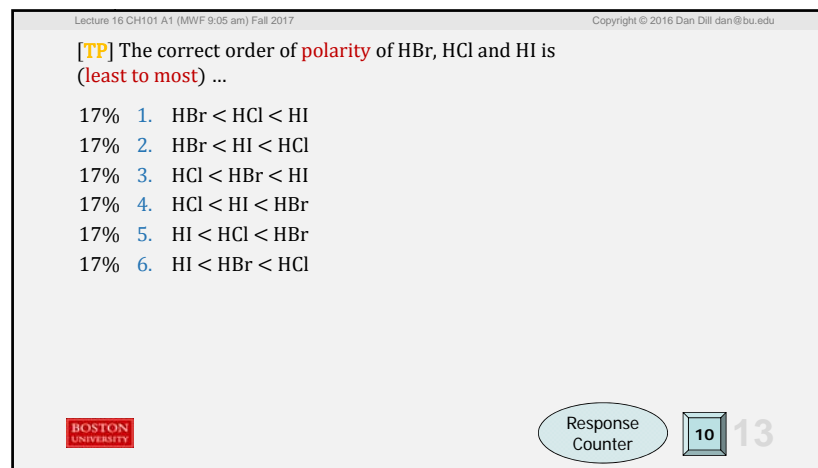
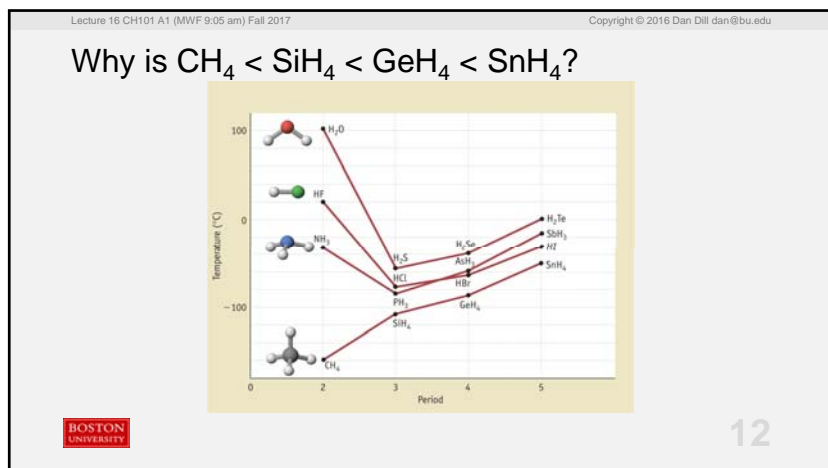
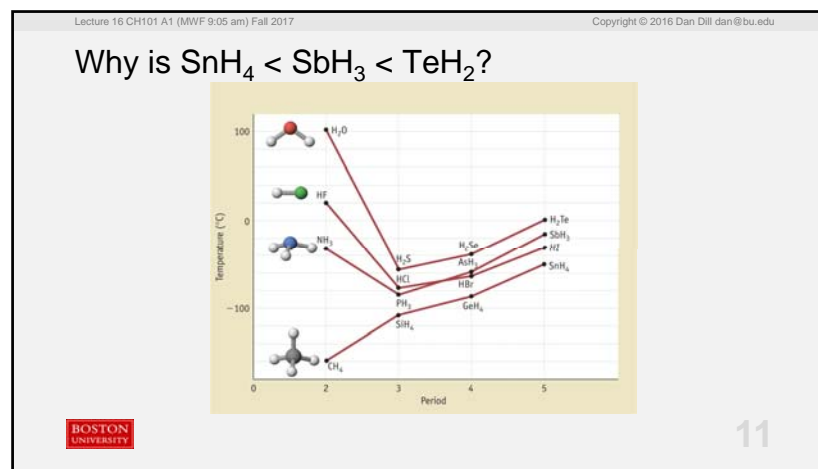
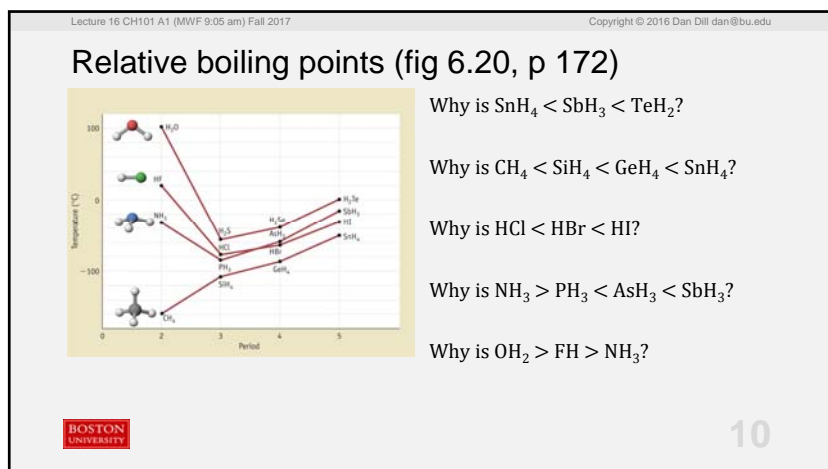
Boiling means particles overcome attraction to their neighbors and depart the liquid.

Relative boiling points reflect relative strength of intermolecular forces ...

- Dispersion
- Dipole-dipole interaction
- Hydrogen bonding

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[TP] The correct order of **boiling point** of HBr, HCl and HI is (lowest to highest) ...

- 17% 1. HBr < HCl < HI
 17% 2. HBr < HI < HCl
 17% 3. HCl < HBr < HI
 17% 4. HCl < HI < HBr
 17% 5. HI < HCl < HBr
 17% 6. HI < HBr < HCl



Response Counter

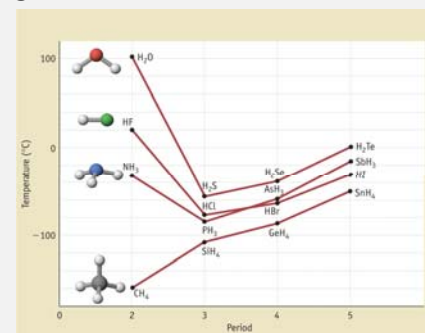
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Why is HCl < HBr < HI?

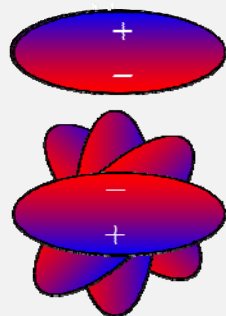


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Dipole can be **attractive** or **repulsive**

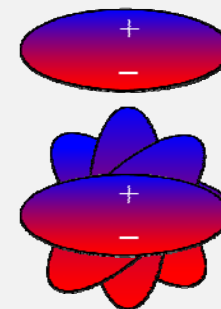


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Dispersion **always attractive**



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