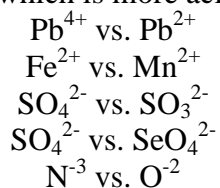


1. For each of the following pairs, predict which is more acidic. Explain your choice.



2. Which molecule has the larger bond angle,  $\text{AsBr}_3$  or  $\text{PI}_3$ ? Explain.
3. Give the complete electronic configuration of Te and the complete set of quantum numbers that describe a **4s-electron** in Te. What is the effective nuclear charge,  $Z^*$ , felt by **the 5p and 4d electrons** in Te? What relatively stable oxidation states (charges) would you expect to observe for a tellurium ion? Give at least 3 and explain.
4. Sketch a quantitatively reasonable acid-base predominance diagram for arsenous acid/arsenite ( $\text{AsO}_3^{-3}$ ). Explain any assumptions and show any calculations. Is arsenous acid a strong or weak acid? Is arsenite ion a strong or weak base?
5. For each of the following molecules or ions, draw a correct Lewis structure and VSEPR structure, name the electronic geometry around the central atom, calculate formal charges, estimate all bond angles and relative lengths, and explain any deviations from ideal.

