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| **Periodic Trends** |
| **Year** | **Q#** | **Description** |
| 1999 | 2 | (biii) compare EA for He+ vs H atom |
| 2000 | 7 | (c) compare first ionization energies |
| 2002 | 6 | (a—b) compare size, 2nd ionization energy |
| 2003b | 7 | Isoelectronic series, C vs Pb in same group, Kr vs He in compound, 1st IE Be/B anomaly  |
| 2005 | 7 | (c) compare/explain 1st IE trend |
| 2006 | 8 | Description of new element based on placement of periodic table |
| 2006b | 7 | (a—c) size, explain BX3, compare 1st IE |
| 2007b | 6 | Given table of IE’s comment on scenarios |
| 2008 | 5 | (a—c) write IE equation, explain 1st IE, predict Xe IE |
| 2009 | 6 | (aii) compare ion size to atom size 9b) IE comparison of isoelectronic series |
| 2010 | 6 | (b) Zn vs Zn2+ for IE |
| 2014 | 5 | (d) use atomic structure and periodicity to explain data |

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| Atomic Structure |
| Year | Q# | Description |
| 1999 | 2 | (a only) Given wavelength cal frequency and energy in joules, energy to break bond electron jump endo or exothermic  |
| 2000 | 7 | (a and b) Similarities/differences in isotopes, electron configuration |
| 2005 | 7 | Given mass of two isotopes, what is element, what is most abundant |
| 2006B | 7 | (d) why each element displays a unique emission spectrum |
| 2007B | 2 | Determine %abundance of two isotopes, use to determine #atoms in sample, energy/wavelength calculations, energy to break single O=O. |
| 2009 | 3 | (b and c) energy, wavelength, and frequency and bond breaking |
| 2009 | 6 | (ai,iii) electron configuration attracted to magnetic field (para/diamagnetic) |
| 2010 | 6 | (b) write electron configuration for Zn2+ |
| 2015 | 1 | (e) electron configuration and sublevel electrons removed from zinc |
| 2015b | 6 | PES, energy calculations |