

# The *d*-Block Elements and Their Compounds

## Trends in Atomic Radii

### **Student Question:**

Which of the following has the smallest atomic radius?

A) Ru

B) Pb

C) Mo

D) Cd

E) Zn

# The *d*-Block Elements and Their Compounds

## Predicting Other Trends

### Student Question:

Predict the trend in the ionization energies of the *d*-block metals

- A) Ionization energy increases from left to right and decreases going down a period
- B) Ionization energy decreases from left to right and decreases going down a period
- C) Ionization energy increases from left to right and increases going down a period
- D) Ionization energy decreases from left to right and increases going down a period

# Coordination Compounds

## Naming Compounds

### Student Question:

What is the name of the complex  $\text{Na}[\text{CoCl}_3(\text{NH}_3)_3]$

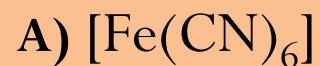
- A) sodium triamminetrichlorocobaltate(II)
- B) sodium triamminetrichlorocobalt(III)
- C) sodium tris(aminechloro)cobaltate(II)
- D) sodium triamminetrichlorocobalt(II)
- E) sodium trichlorotriamminecobalt(III)

# Coordination Compounds

## Naming Compounds

### Student Question:

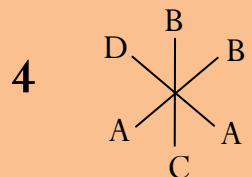
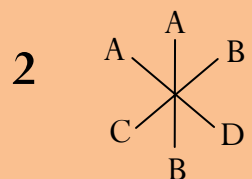
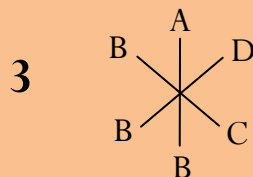
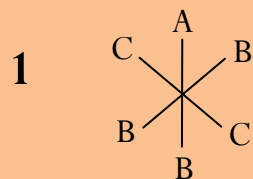
Which of the following is the formula of potassium hexacyanoferrate(II)?



# Coordination Compounds

## Isomers

### Student Question:



Which of the complexes is not chiral?

A) 1

B) 2

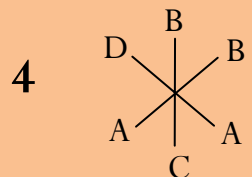
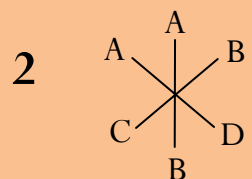
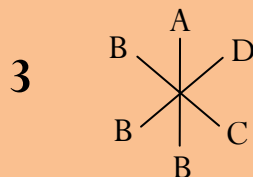
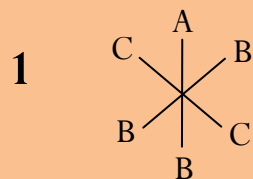
C) 3

D) 4

# Coordination Compounds

## Isomers

### Student Question:



Which of the following are an enantiomeric pair

A) 1 and 2

B) 1 and 3

C) 1 and 4

D) 2 and 3

E) 2 and 4

F) 3 and 4

# The Electronic Structure of Complexes

## Crystal Field Theory

### Student Question:

Predict the number of unpaired electrons of an octahedral  $d^6$  complex (a) strong field ligands and (b) weak field ligands.

A) (a) 4 and (b) 0

B) (a) 0 and (b) 4

C) None of the above

# The Electronic Structure of Complexes

## Crystal Field Theory

### Student Question:

What change in magnetic properties can be expected when  $\text{NO}_2^-$  (strong field ligand) ligands in an octahedral complex are replaced by  $\text{Cl}^-$  (weak field ligand) ligands in a  $d^6$  complex?

- A) The complex goes from paramagnetic to diamagnetic
- B) The complex goes from diamagnetic to paramagnetic
- C) The complex stays paramagnetic
- D) The complex stays diamagnetic