LESSON 23.1

CLASSWORK

Alchemy of Paint
Transition Metal Chemistry

Name _____

Date _____ Period _____

Purpose

To examine the charges on transition metal cations..

1. Complete the table that shows colored compounds that might be used in paint pigments.

Color	Chemical name	Formula	Cation	Anion
white	calcium oxide	CaO	Ca^{2+}	O^{2-}
pink	manganese (II) oxide	MnO		O^{2-}
black	iron (II) oxide	FeO		O^{2-}
blue	cobalt (II) oxide	CoO	Co^{2+}	O^{2-}
orange	chromium (III) oxide	Cr_2O_3		O^{2-}
red brown	iron (III) oxide			O^{2-}
white	aluminum oxide			O^{2-}
brown	manganese (IV) dioxide	MnO_2		O^{2-}
white	sodium chloride	NaCl		Cl^-
yellow green	cuprous (I) chloride	CuCl		Cl^-
	magnesium chloride			Cl^-
pink	cobalt (II) chloride	$CoCl_2$	Co^{2+}	Cl^-
green	nickel (II) chloride			Cl^-
blue-green		$CuCl_2$		Cl^-
light green		$FeCl_2$		Cl^-
white		$AlCl_3$		Cl^-

2. Where are the metal cations in these colored compounds located on the periodic table?

3. Are the charges on the metal cations in the table always consistent with group number on the periodic table? Explain.

4. What do the Roman numerals I, II, III, and IV in names indicate?

5. What is the difference between manganese (II) chloride and manganese (IV) chloride? Write chemical formulas for each compound.

6. It is not necessary to write sodium chloride as sodium (I) chloride. Explain why.

7. Making Sense How can you determine the charge of the iron cation in $Fe_2(SO_4)_3$?