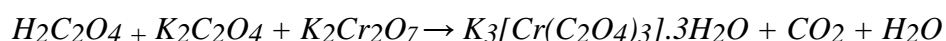


**PROF. DR. SELEN BİLGE
KOÇAK**

CHM356 INORGANIC CHEMISTRY LABORATORY

EXPERIMENT NUMBER	11
THE NAME OF THE EXPERIMENT	POTASSIUM TRIOXALATOCHROMATE (III)
FORMULA	$K_3[Cr(C_2O_4)_3].3H_2O$

REACTION EQUATION



EXPERIMENTAL PROCEDURE

An aqueous saturated solution containing 4 g of potassium dichromate is added dropwise to the aqueous solution containing 9 g of oxalic acid dihydrate and 4 g of potassium oxalate monohydrate with stirring. When the reaction is completed, the solution is evaporated to one fifth of its first volume and allowed to crystallize. The product is filtered off, washed with alcohol and dried in the air. The product is in the form of scales with black-green, transparent blue edges.

QUESTIONS

1. Balance the chemical equation.
2. What is the role of oxalate ion in this reaction other than being a bidentate ligand?
3. Provide information on the nomenclature of coordination compounds.
4. Write and compare the electron configurations of chromium and its subgroup elements.

Working rate: 1/4

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KOÇAK**

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EXPERIMENT NUMBER	12
THE NAME OF THE EXPERIMENT	POTASSIUM TRIOXALATOALUMINATE(III)
FORMULA	$K_3[Al(C_2O_4)_3].3H_2O$

EXPERIMENTAL PROCEDURE

1 g of metallic aluminum is placed in a 200 mL beaker and 10 mL of water is added to the beaker. 30 mL of 20g /100 mL KOH solution is added to this mixture. The mixture is heated in boiling temperature until the aluminum dissolves. The resulting solution is filtered through a funnel containing glass cotton. A further 10 mL of water is added to the solution and heated to boiling point. 14 g of oxalic acid dihydrate is added in portions to the hot solution. Excess of oxalic acid is avoided. The neutral solution is filtered and cooled to room temperature. 50 mL of ethanol is added to the cooling solution and cooling is continued. The resulting colorless crystals are filtered, washed with ethanol and dried in the air.

QUESTIONS

1. Write and balance the chemical equation.
2. Write the open structure of the complex.
3. Although potassium trioxalatochromate(III) is colored, why potassium trioxalatoaluminate(III) is colorless. Write the electron configuration of both metal ions and explain.
4. Write and compare the electron configurations of Be, Mg, Al, Ga and In.

Working rate: 1/2

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GENERAL INFORMATION

<i>Coordination number</i>	<i>Geometry</i>	<i>Hybridization</i>
2	Linear	$sp (s, p_z)$
3	Triangle plane	$sp^2 (s, p_x, p_y)$
4	Tetrahedron	$sp^3 (s, p^3)$
4	Tetrahedron	$d^3s (d_{xy}, d_{xz}, d_{yz}, s)$
4	Square plane	$dsp^2 (d_{x^2-y^2}, s, p_x, p_y)$
5	Triangular bipyramid	$dsp^3 (d_{z^2}, s, p^3)$
5	Square pyramid	$dsp^3 (d_{x^2-y^2}, s, p^3)$
6	Octahedron	$d^2sp^3 (d_{x^2-y^2}, d_{z^2}, s, p^3)$
6	Triangular prism	$d^2sp^3 (d_{xz}, d_{yz}, s, p^3)$
6	Triangular prism	$d^5s (d^5, s)$
7	Pentagonal bipyramid	$d^3sp^3 (d_{xy}, d_{x^2-y^2}, d_{z^2}, s, p^3)$
7	Capped triangular prism	$d^3sp^3 (d_{xy}, d_{xz}, d_{z^2}, s, p^3)$
8	Cube	$sp^3d^3f (s, p^3, d_{xy}, d_{xz}, d_{yz}, f_{xyz})$
8	Dodecahedron	$d^4sp^3 (d_{z^2}, d_{xy}, d_{xz}, d_{yz}, s, p^3)$
8	Square antipirism	$d^4sp^3 (d_{x^2-y^2}, d_{xy}, d_{xz}, d_{yz}, s, p^3)$
9	Tricapped triangular prism	$d^5sp^3 (d^5, s, p^3)$