

***Credit River
Secondary School***



October 22, 2018

Dear Principal Groen,

We are writing to you to update you on our senior Chemistry classes here at Credit River Secondary School. Although the students are doing well in the course, we have recently discovered a problem in our senior laboratory where the labels of five (5) of the chemical bottles have fallen off. Since all 5 chemicals are clear, colourless liquids, we have no way to easily identify them. As you know, we need to exercise the utmost care when handling chemicals and since their identity is unknown, we are unable to perform the necessary experiments to complete the curriculum.

We have contacted chemists at the University of Toronto and they were able to run a series of reactions using the unknown chemicals with a small number of reagents to help us identify the unknowns. We have included their report below and have asked our senior chemistry students to help me identify the unknowns using this report. We are confident our students have the ability to identify these unknowns and will update you shortly with their progress.

Sincerely,

Ms. Couper

Department Head, Science and Technology Program
Credit River Secondary School
(613) 555-0196 ext. 441

and

Mr. Wöhler

Science Teacher
Credit River Secondary School
(613) 555-0196 ext. 574

CHEMICAL ANALYSIS REPORT

CLIENT: MS. COUPER/MR. WÖHLER
OUR REF.: ORDER 102576-A

DATE RECEIVED: OCTOBER 20, 2018
DATE TESTED: OCTOBER 22, 2018
DATE REPORTED: OCTOBER 22, 2018

SUBJECT: CHEMICAL ANALYSIS OF 5 UNKNOWN SAMPLES

PROCEDURE USED: ALL 5 UNKNOWN CHEMICALS (LABELLED #1-5) WERE REACTED WITH 4 REAGENTS (HBr, H₂SO₄, K₂Cr₂O₇ and LiAlH₄). THE PRODUCT OF THE REACTION OF EACH UNKNOWN WITH EACH REAGENT IS SUMMARIZED IN THE TABLE BELOW.

TEST RESULTS:

REAGENT	Unknown #1	Unknown #2	Unknown #3	Unknown #4	Unknown #5
HBr	2-bromopentane + 1-bromopentane	bromocyclohexane	1-bromobutane	N . R .	N . R .
H ₂ SO ₄	N . R .	cyclohexene	but-1-ene	N . R .	N . R .
*K ₂ Cr ₂ O ₇	N . R .	cyclohexanone	butanoic acid	N . R .	propanoic acid
LiAlH ₄	N . R .	N . R .	N . R .	3-methylhexan-1-ol	propan-1-ol

Note:

N.R. = No reaction was observed

*water is present in the reaction vessel of K₂Cr₂O₇ with the unknowns