INTRODUCTION TO NATURAL SCIENCE

SAMPLE LAB REPORT, FALL 2006

Based on Chemistry Lab II

Part I - Preparing solutions w/ volumetric glassware

solution	absorbance	concentration
A	0.41522	0.2%
B	0.47643	0.3%

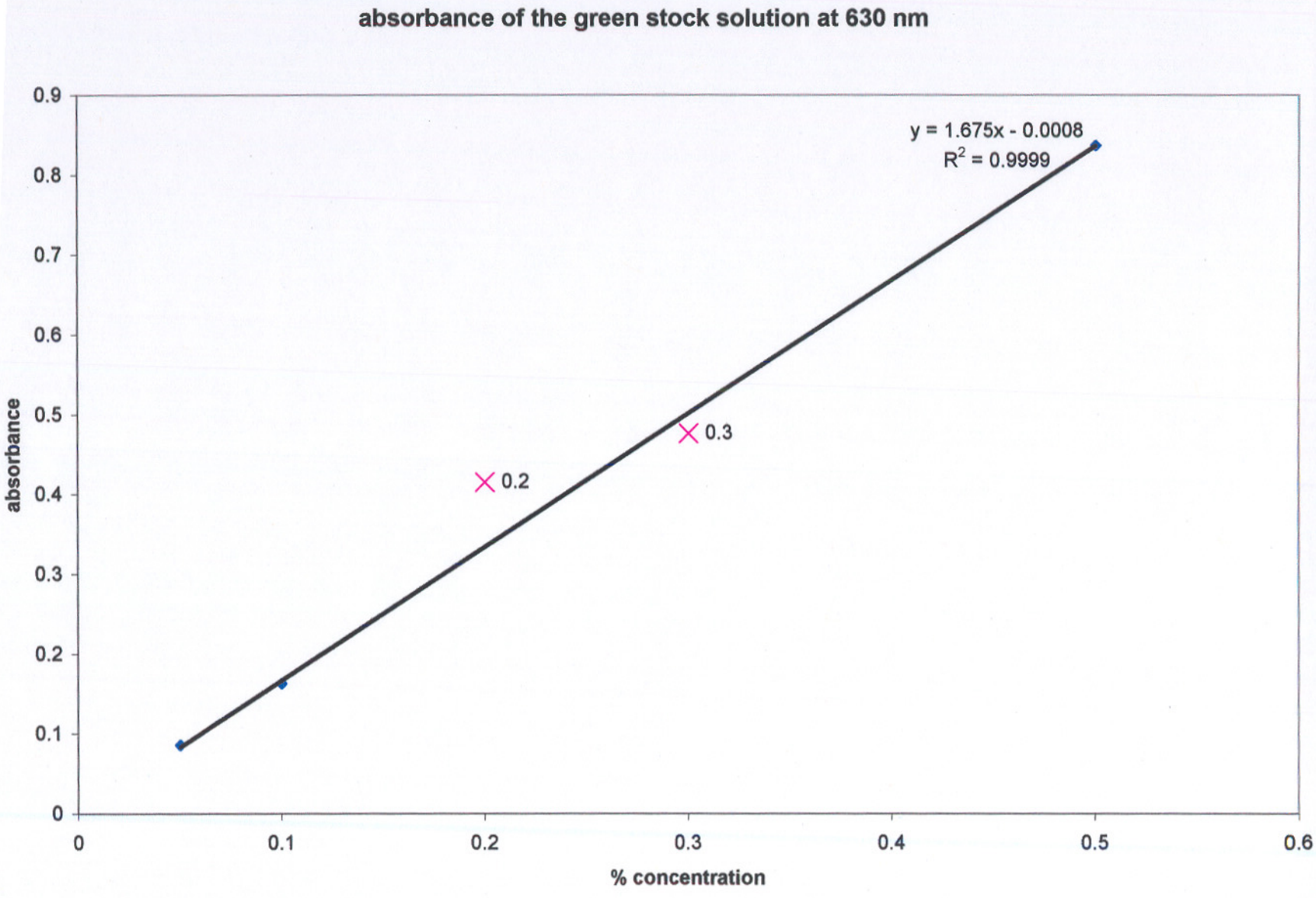
conclusions

It is clear from ~~to~~ my graph that solution B had the desired concentration (closer to the calibration line). Solution A is further away from the calibration line, indicating that there was error involved in the preparation. It seems that my ability to prepare solutions accurately improved with practice!

Absorbance of the green solution at 630 nm

concentration (%)	absorbance
0.5	0.8371
0.1	0.163
0.05	0.0862

Solution A	0.2	0.41522
Solution B	0.3	0.47643


absorbance of the green stock solution at 630 nm
y = 1.675x - 0.0008
R2 = 0.9999
0.2
0.3
absorbance
% concentration
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
0
0.1
0.2
0.3
0.4
0.5
0.6

Part II - Getting to know the elements

Expt 1

Observations -

When bleach and hydrogen peroxide were mixed there was an immediate bubbling and fizzing. This indicated that a gas was evolving. A match that was glowing, when placed in this gas, reignited.

conclusion - The gas evolved is O_2 and O_2 aides in burning

Expt 2

Observations -

Liquid nitrogen bubbled continuously and continued to evaporate. Initially a "smog" formed at the mouth of the container, but this disappeared after a while. When a burning match was held to the mouth of the liq. N_2 cup, it went out.

conclusions -

liquid nitrogen does not support fires. Also the cold temperature of liq. N_2 liquifies the O_2 in the atmosphere. without O_2, fire goes out.

Expt 3

Observations -

The solid sulfur caught fire and quickly became a purple liquid. When removed from the flame this liquid continued to burn. After a while, the liquid disappeared.

conclusion -

The burning of sulfur is most likely a chemical change.

Expt 4 - magnetism of metals

Observations -

The following metals were attracted to the magnet - Fe and Ni

The following metals were not attracted to a magnet - Zn, Ca, Al, Cu, Mg

conclusion -

Not all metals are magnetic.

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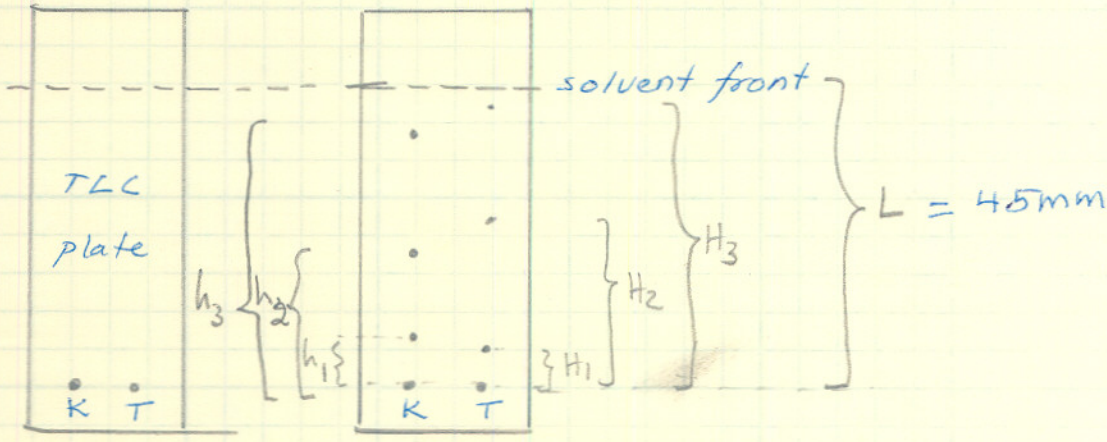
Part III

Observations



K = kale
T = tree

		distance	color	$R_f = h/L$ or H/L
Kale	h_1	6.5mm	yellow	6.5mm/45mm = 0.14
	h_2	22 mm	light green	22mm/45mm = 0.49
	h_3	44 mm	yellow	44 mm/45mm = 0.98
Tree	H_1	3 mm	faint yellow	3 mm/45 mm = 0.07
	H_2	25 mm	yellow	25mm/45mm = 0.56
	H_3	44.5mm	yellow	44.5mm/45 mm = 0.99

Conclusions.

Based on these R_f values, the colors of the spots and the reference R_f values, the compounds present in kale and Tree leaf extracts are as follows.

Kale	h_1	xanthophyll	Tree	H_1	unsure
	h_2	chlorophyll a1		H_2	xanthophyll
	h_3	carotene		H_3	carotene

Kale extract		
Reference		
Pigment	**Visible Color**	**Rf**
Xanthophyll	yellow	0.15
Chlorophyll b	Dark yellow-green	0.25
Neoxathin	Yellow-brown	0.28
Chlorophyll b1	Light yellow-green	0.30
Chlorophyll a	Dark blue-green	0.46
Chlorophyll a1	Light blue-green	0.48
Xanthophyll	Yellow	0.50
Phaeophytin b	Light grey	0.60
Violaxathin	Yellow-brown	0.66
Phaeophytin a	Dark grey	0.67
Leutein	Yellow-brown	0.75
Xanthophyll	Red	0.80
Lycopene	Yellow-orange-red	0.81
Xanthophyll	Yellow	0.86
Beta Carotene	Yellow-orange	0.94
Alpha Carotene	Yellow-orange	0.97
Carotene	Yellow	0.98

It is clear from this experiment that although Chlorophyll is present in kale (green leaf) it is absent in the tree extract (fall leaf). Chlorophyl disappears during the fall season. carotenes and xanthophylls, which are present in both leaves, become more visible when the green chlorophyl disappears.

The kale leaf extract is a ~~homogeneous~~ mixture because the TLC showed that it is made up of the combination of several things (mixture). Since the chemica composition is the same throughout the kale extract, it is a homogeneous mixture.

TLC is a separation technique for homogene mixtures. Filtration is a separation technique for heterogeneoses mixtures.

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