Procedure:

1. read STAWA procedure
2. Safety considerations include:

- use of Bunsen burner - use safety flame when not in use
- hot objects - crucible will be very hot from the bunsen burner
    - use metal tongs to move lid when required
    - let crucible and clay triangle cool down sufficiently before cleaning up
- $BaCl_2$ is poisonous - do not let it touch your skin
    - use spatula to move it to the crucible
- wear safety glasses

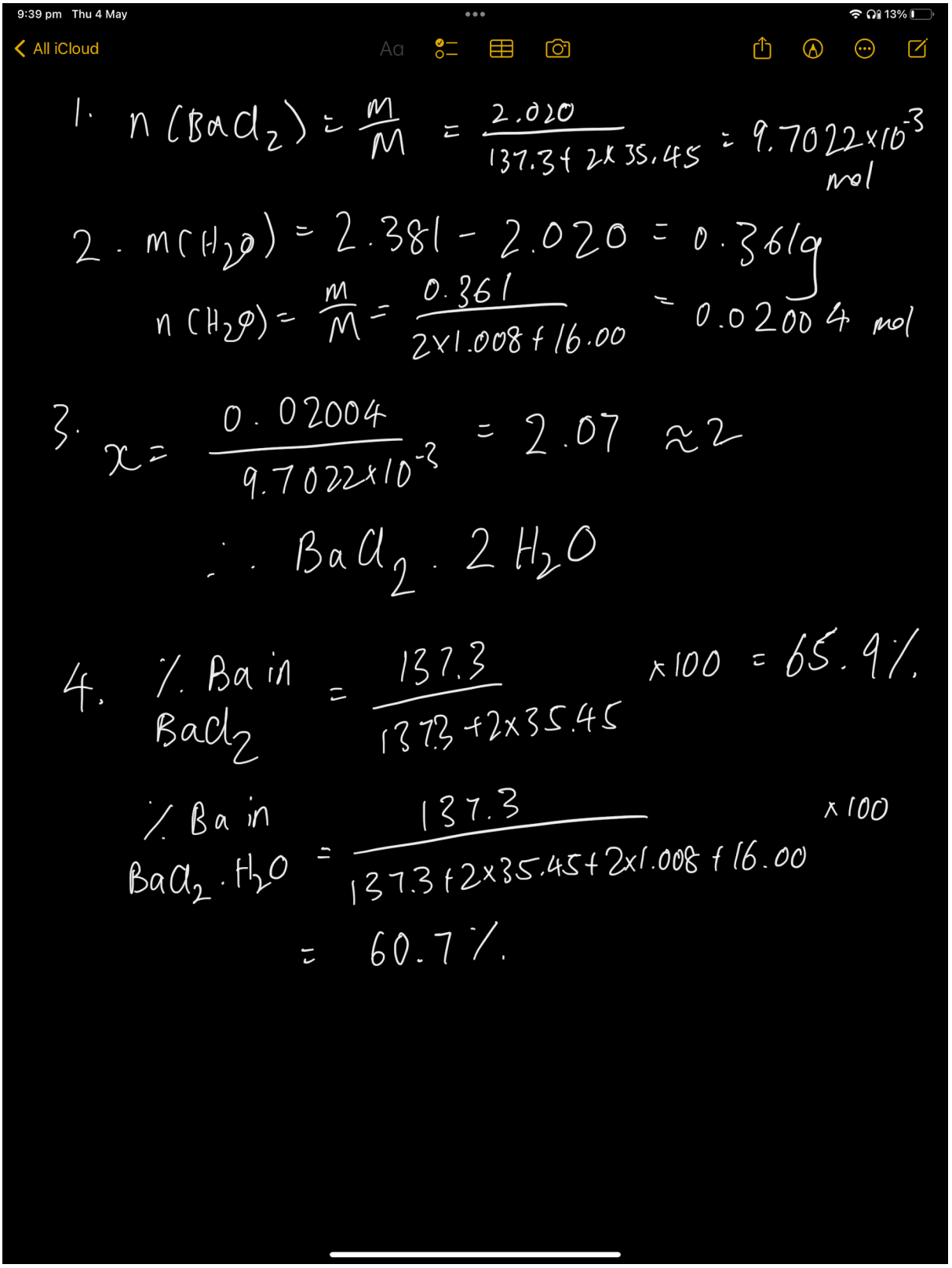
Further notes at
https://docs.google.com/document/d/11rgNdhQiFNuZy60uDJgigB2TILz0zmf41db6Ro24QUs/edit

3. in video

Results and Observations:

Materials	Mass (g)
Crucible & Lid	19.888
Crucible, lid & hydrated barium chloride	22.269
hydrated barium chloride	22.269 - 19.888 = 2.381
crucible, lid & barium chloride	21.908
barium chloride	21.908 - 19.888 = 2.020

Processing of result and questions



Post-lab questions

Post Lab Q

1. $m(MgCO_3) = 7.58\ g$

$m(H_2O) = 15.67 - 7.58\ g = 8.09\ g$

$M(H_2O) = 2 \times 1.008 + 16.00 = 18.016\ g\ mol^{-1}$

$\frac{8.09\ g}{18.016} = 0.4490\ mol$

$n(MgCO_3) = \frac{m}{M} = \frac{7.58}{24.31 + 12.01 + 3 \times 16.00} = 0.08990\ mol$

$0.4490\ mol\ H_2O : 0.08990\ mol\ MgCO_3$

$5 : 1$

$\therefore$ formula $= MgCO_3 \cdot 5H_2O$

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2. $m(H_2O) = 3.216 - 2.222 = 0.994g$

$n(H_2O) = \frac{m}{M} = \frac{0.994}{18.016} = 0.05517\ mol$

$n(Na) = \frac{m}{M} = \frac{0.5077}{22.99} = 0.02208\ mol$

$n(B) = \frac{m}{M} = \frac{0.4775}{10.81} = 0.04417\ mol$

$m(O) = 2.222 - 0.5077 - 0.4775 = 1.2368g$

$n(O) = \frac{m}{M} = \frac{1.2368}{16.00} = 0.0773\ mol$

$x : y : z : X$

$0.02208 : 0.04417 : 0.0773 : 0.05517$

÷ by smallest no. ⟶ 0.02208

$1 : 2 : 3.5 : 2.5$

× 2

$2 : 4 : 7 : 5$

$\therefore x = 2,\ y = 4,\ z = 7,\ X = 5$

formula = $Na_2B_4O_7 \cdot 5H_2O$