

Project 5: Designing a TSA: An Overview, Video

Supplement
TheCaseSolutions.



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Supplement TheCaseSolutions.com



Objectives
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Design a calcium supplement that could be taken as a daily liquid

Criteria

- It must be clear
- It has a pill between a seal so
- It does not contain any toxic materials
- It has a known concentration in order to determine the amount needed for three-year-old dose



Objectives

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Design a calcium supplement that could be taken as a clear liquid

Criteria:

- It must be clear
- It has a pH between 4 and 10
- It does not contain any toxic materials
- It has a known concentration in order to determine the amount needed for the required dose



Week 1 Procedure

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- Objective: find the solubility properties of calcium salts using calcium nitrate as a source of soluble calcium
- Mixed $\text{Ca}(\text{NO}_3)_2$ with each of the 9 reagents provided and recorded observations
- 5 drops of a reagent mixed with 5 drops of the calcium nitrate in a single well of the well plate (* done for all 9)

Solubility Chart

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| Reagents: | Result: |
|----------------------------------|--|
| Sodium Nitrate | No precipitate; soluble |
| Sodium Hydrogen Phosphate | Cloudy Precipitate; insoluble |
| Sodium Chloride | No Precipitate; soluble |
| Sodium Phosphate Tribasic | Slightly Cloudy Precipitate; insoluble |
| Sodium Oxalate | Thick, Cloudy Precipitate; insoluble |
| Sodium Dihydrogen | No Precipitate; soluble |
| Sodium Carbonate | Cloudy Precipitate; insoluble |
| Sodium Acetate | No Precipitate; soluble |
| Sodium Sulfate | No Precipitate; soluble |

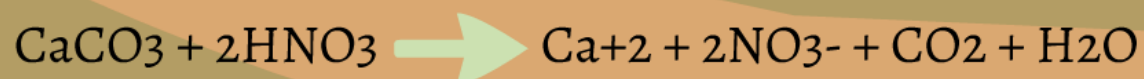
Week 2

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Objective: Chemically alter calcium carbonate to make it soluble in water rather than forming a precipitate

- Used between 1-2g of Calcium nitrate and make 3 solutions of Ca^+ ions by dissolving in HCl , $\text{CH}_3\text{CO}_2\text{H}$, HNO_3
- Adjust pH if necessary by adding NaOH (excess acid)

Week 2 Procedure



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Results

- HCl was chosen as the acid to dissolve the CaCO_3 with.
- Through molar calculations, it was determined that approximately 68 mL of the solution is needed to be consumed in order to meet the daily nutritional value.

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Why choose M2J2 Calcium Supplement???

- Clear, with good consistency
- Only have to drink a small amount
- An easy way to get recommended Calcium Intake
- DELICIOUS UNTIL THE LAST DROP!!!!

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