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| **Lesson Plan:**  |

**Big Ideas**

1. Acid or base alone is different when they're mixed in water. Water acting as a weak acid/base sets pH/pOH limit even when strong acid/base is added.

**PLOs**

**E2** perform calculations relating pH, pOH, [H3O+], and [OH-]

**E3** explain the significance of the Ka and Kb equilibrium expressions

**E4** perform calculations involving Ka and Kb

**Material and equipment needed**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Premade HCl | Standardized NaOH | 14 burets | 14 suction bulbs | 14 volumetric pipet (10mL) | 14 buret stands and clamps |
| 14 Erlenmeyer flasks (250mL) | 28 safety goggles | White vinegar (500mLs) | Phenolphthalein solution | Safety buckets | dust bin |
| Beakers | Water bottles |  |  |  |  |

**Assessment Plan:**

**Formative -** Lab write up

**Pre-lab**

- Open sinks

- Safety bins

- Try 1 trial

- Black board instructions:

1) Groups of 3 and find 1 corner of a bench

2) Clear the bench of clutter and the floor around you

3) Grab the equipment listed on your lab package + wash bottle of distilled water +white paper+ 2 beakers (pre stacked) and get ready at your bench

4) No chemicals yet

**Hook and Introduction**

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| --- | --- | --- | --- |
| **Time** | **Activity** | **Teaching notes** | **Assessment** |
| 10:15 - 10:25  | * Get equipment
 | * Instructions on board (before bell rings too)
 |  |

**Development**

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| --- | --- | --- | --- |
| **Time** | **Activity** | **Teaching notes** | **Assessment** |
| 10:30-10:45 | * Demonstration
 | * Safety first: Safety goggles! Glass bin location, fragile equipment, corrosive chemicals
* Rod and clamp
* Wash buret first with 15mL NaOH - demonstrate how to roll the buret and need to drain it by the sink - why wash? (bubbles + clean)
* Demonstrate the pipet technique + what to watch out for - if you accidentally get acid in, wash and use new bulb
* phenolphthalein and white paper under flask
* Pale pink for 30s
* Data: Class data, need to write down before end of class
* Getting chemicals - designate half the class as unknown acid, the other half as vinegar
 |  |
|  10:45-11:15 | * Lab
 | * Can call everyone in and double check if they know what they're doing
* Remind them about data table
 | * Working with individual groups
 |
| 11:15-11:25 | * Clean up procedure
 | * Neutralize acid with base
* wash buret and pipet (use bulb) with water
 |  |

**Closure**

|  |  |  |  |
| --- | --- | --- | --- |
| **Time** | **Activity** | **Teaching notes** | **Assessment** |
| 11:25-11:35 | * Clean up
 | Share data with other groups if not finishedAnnouncements |  |

2 Part quiz next class - Material after spring break

Unit test - Monday April 14th