

Titration Curve Analysis: Key Concepts

I. Overall Plot Information

- **Y-axis (pH Scale)**

- Ranges from **0 to 14**.
- Markings at **0, 1, ..., 14**.

- **Key point: pH = 7 (Neutrality)**

- **X-axis (Volume of 0.100 M NaOH added (mL))**

- Ranges from **0 to 50 mL**.
- Markings at **0, 5, ..., 50 mL**.

II. Titration of Strong Acid (HCl)

- **Plot Characteristics:**

- **Starts low pH** (strong acid).
- **Steep curve** around equivalence point.

- **Equivalence Point:**

pH: 7.00 (Neutral)

- **Indicator Diagram:**

- **Litmus pH range** (~5.0-8.0) - Suitable
- **Methyl orange pH range** (~3.1-4.4) - Not ideal (too acidic)

III. Titration of Weak Acid (CH_3COOH)

- **Plot Characteristics:**

- **Starts higher pH** (weak acid).
- **Buffer region** observed.
- **Less steep curve** at equivalence point compared to strong acid.

- **Equivalence Point:**

pH: 8.72 (Slightly Basic)

- **Indicator Diagram:**

- **Phenolphthalein pH range** (~8.2-10.0) - Suitable

Basal Ganglia Circuit Components

Overall Activity Patterns

- **Transient Activity:** Brief, phasic, specific responses.
- **Tonic Activity:** Sustained, continuous, background firing.

I. Cortical Regions and Activity

- **Cerebral Cortex:** (Transient Activity)
- **Transient Signal:** (Transient)
Context: This label appears directly after "Cerebral cortex" in the original text, potentially indicating a general characteristic of cortical output or another transient signal originating from the cortex.
- **Frontal Cortex:** (Transient Activity)

II. Striatal Components & Dopamine Receptor Pathways

- **Caudate/Putamen:**
 - Associated with the **D1 receptor pathway**.
 - Associated with the **D2 receptor pathway**.

III. Thalamic Relay & Associated Activity

- VA/VL complex of thalamus:
 - **Transient Signal 1: (Transient)**
Context: This label appears after "D2" and in proximity to the VA/VL complex in the original sequence.
 - **Transient Signal 2: (Transient)**
Context: This label appears immediately following the previous transient signal in the original sequence, further emphasizing a transient characteristic related to this part of the circuit, possibly the thalamic output.

IV. Basal Ganglia Output Nuclei & Activity

- Globus pallidus, external segment: **(Tonic Activity)**
- Globus pallidus, internal segment: **(Tonic Activity)**
- Subthalamic nucleus: **(Transient Activity)**