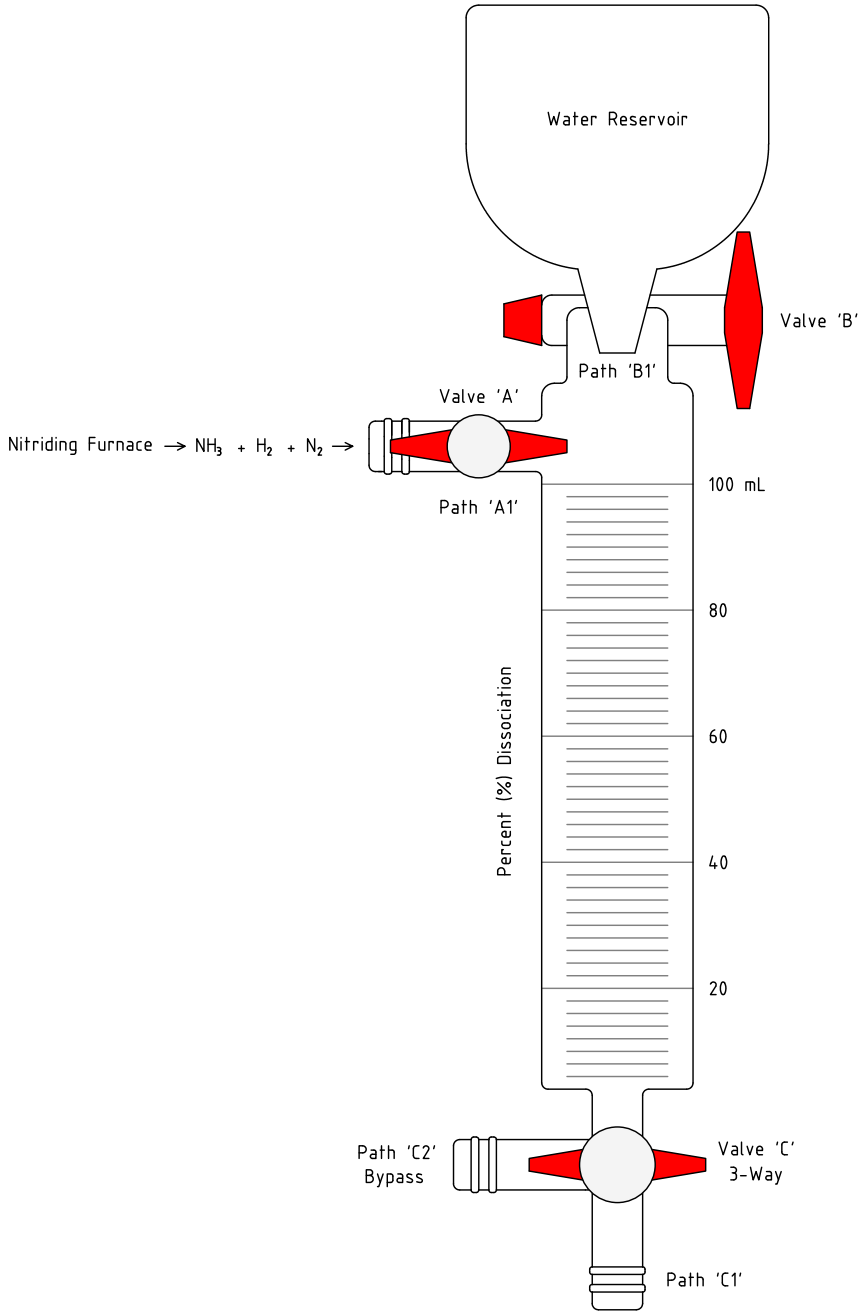

Parkes ADB100 Ammonia Dissociation Burette Instructions

Purpose

The purpose of an ammonia dissociation burette is to determine the percentage of ammonia dissociated (%DA) during the nitriding process. Pressure in the furnace is controlled with a manual valve or oil bubbler where the expected back pressure is approximately 4 inches of oil. The outlet gas from the nitriding furnace consists of nitrogen (N_2), hydrogen (H_2), and undissociated ammonia gas (NH_3). Ammonia gas is highly soluble in water, however nitrogen and hydrogen are insoluble. This difference in solubility is utilized to determine the extent of ammonia dissociation during the nitriding process.

Instructions

1. Begin with closing `Valve 'A'`, `Valve 'B'`, and opening `Valve 'C'` to `Path 'C1'` for purging
2. Open `Valve 'A'` to allow gas from the nitriding furnace into the graduated cylinder
3. After the air has been purged from the graduated cylinder, close `Path 'C1'` and open `Path 'C2'` to direct gas flow back to pressurized path
4. Fill the `Reservoir` with distilled water
5. Close `Valve 'A'` and `Valve 'C'`
6. Open `Valve 'B'` to allow water into the graduated cylinder, which will absorb any unreacted NH_3
7. The water will stop flowing once the NH_3 is consumed, and you can read the resulting %DA

The water immediately absorbs the ammonia, leaving the insoluble nitrogen and hydrogen in the atmosphere above the liquid in the burette.

At relatively low dissociation percentages, dissociation is controlled by adjusting the ammonia flow into the nitriding furnace.

At higher dissociation percentages, dissociation is controlled by adjusting both the ammonia and dissociated ammonia flow into the nitriding furnace.

Parkes Ammonia Dissociation Burette					
RP Drawn By	2022-12-14 Date	DWG-47-01327 Drawing Number	A Rev	1 Sheet	N/A Scale

PARKES SCIENTIFIC CANADA