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A Simple Apparatus for Potentiometric Titrations

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Poster Presentation P15

A SIMPLE APPARATUS FOR POTENTIOMETRIC TITRATIONS

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A new, simple apparatus has been developed for high-precision potentiometric titrations to determine the protonation constants of azamacrocyclic ligands. The inexpensive set-up serves as an economical alternative to automatic titrators, which cost up to \$8000. The apparatus consists of a 250-mL jacketed reaction vessel clamped over a stir plate and connected to a chiller for temperature control. To prevent contamination of solutions by atmospheric carbon dioxide, the vessel is tightly sealed with a rubber stopper and maintained under a positive pressure of nitrogen. The rubber stopper contains three holes for the nitrogen inlet, the pH electrode, and titrant delivery. The titrant solution is stored under nitrogen during the titration and is added to the reaction vessel in small increments by micropipet. When the apparatus was utilized to standardize a KOH solution against potassium hydrogen phthalate, the relative standard deviation in the concentration was 2 %. Current investigations are underway to improve accuracy and precision.