

## Chapter 3: conductivity and conductometry

### ACTIVITY 5 : Conductometric titration of a cough syrup

#### Introduction

**Objectives:** The present study developed and validated a conductometric method for determination of Diphenhydramine HCl (DPH) in its pure form and in a syrup formulation using silver nitrate ( $AgNO_3$ ).

**Methods:** Conductometric titration method was achieved by using  $AgNO_3$ . The method is built on the reaction of chloride ions coming from the DPH with  $Ag^+$  yielding silver chloride precipitate. Conductance of the solution is measured as a function of the volume of titrant. The proposed method is linear over the range of 1-10mg.

**Source:** Conductometric determination of the antihistaminic diphenhydramine hydrochloride using silver nitrate as a titrant analytical chemistry department, Zagazig University, Egypt

#### DOCUMENT 1: Diphenhydramine HCl (DPH)

DPH (Fig. 1) is a first-generation anti-histaminic possessing anti-allergic, antitussive and sedative properties that is mainly used to treat allergies. It is found in various pharmaceutical preparations.

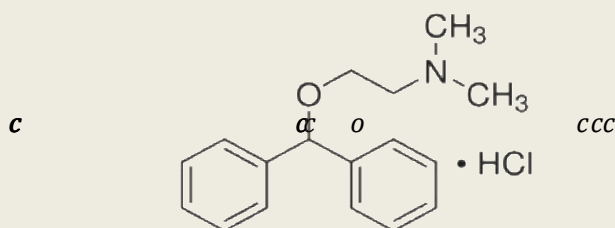


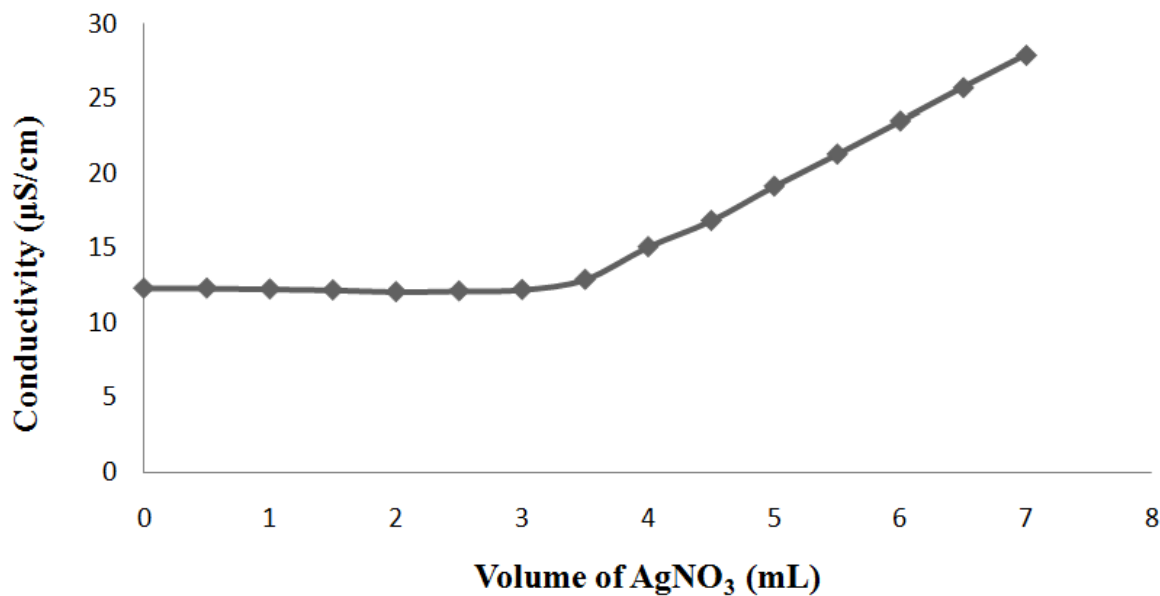
Fig. 1: Chemical structure of Diphenhydramine HCl (DPH)



**Source:** Conductometric determination of the antihistaminic diphenhydramine hydrochloride using silver nitrate as a titrant analytical chemistry department, Zagazig University, Egypt

**DOCUMENT 2: Cough syrup titration**

A dose of cough syrup is titrated using silver nitrate titrant:



Molar concentration of (Ag<sup>+</sup>, NO<sub>3</sub><sup>-</sup>) solution:  $C = 5.10^{-3} M$

Source: Conductometric determination of the antihistaminic diphenhydramine hydrochloride using silver nitrate as a titrant analytical chemistry department, Zagazig University, Egypt

■ Acquiring vocabulary

English	French
conductimetric titration	
to treat allergies	
cough syrup	
titrant	

■ Problem solving

What is the mass of DPH in the dose of cough syrup titrated in **document 2**?

## Activity summary

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What you must remember:

- Conductivité<sub>SEP</sub>
- Conductivité ionique molaire

Skills linked to the curriculum:

Compétences	Capacités à maîtriser
- ANA	Interpréter ou prévoir l'allure d'une courbe de titrage conductimétrique à partir de données, sans tenir compte de l'effet de la dilution.
- REA	Réaliser un protocole de titrage mettant en jeu une réaction suivie par conductimétrie.
- COM	Formuler et argumenter des réponses structurées Formuler et présenter une conclusion