

18th ASIAN CONFERENCE ON SOLID STATE IONICS ACSSI - 2024

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MEENAKSHI COLLEGE FOR WOMEN
(Autonomous)

Kodambakkam, Chennai - 600024, India

BOOK OF ABSTRACTS

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Withania somnifera – as proton conducting solid electrolyte for Proton cell and EDLC: A comparative study

Meera Naachiyar Ramadhasan^{*,a,b}, Ragam M^a, Roshini J^b, Marshalin Reena C^b, Leena

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Abstract

The dried root powder of *Withania somnifera* (plant *Ashwagandha*) has more medicinal properties that can mainly cure nervous disorder, hypothyroidism, diabetics, helpful in boosting the immune system, has anti-inflammatory activity etc. This root involves withanolides, withanine and withaferin as major chemical constituents (Fig 1) that attribute more medicinal values [1-5]. Besides their medicinal values, the preference of dried root powder of *Withania somnifera* as host towards the use of solid electrolytes in electrochemical devices is due to the presence of more number of –OH groups in the overall chemical constituents that helps in attracting the cation of any ionic salts used for ionic conduction.

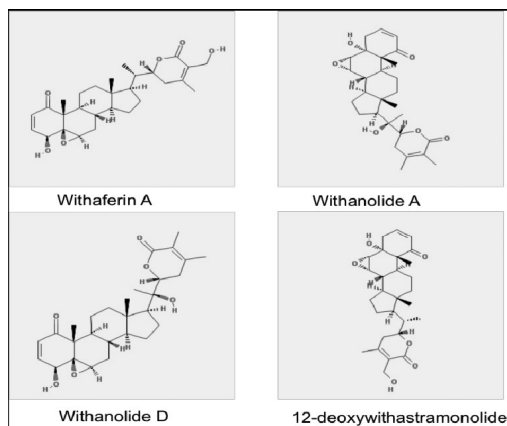


Fig 1 Structure of major constituents of root part of *Withania somnifera*

This work discusses about the effect of incorporation of ammonium formate (NH_4HCO_2) and ammonium nitrate (NH_4NO_3) salt as ion provider for the host in proton cell and EDLC. Ammonium salts can provide more H^+ for proton transportation in the host. This is mainly due to the loosely bounded H^+ ion in the ammonium salt structure.

Using the solution casting technique, with double distilled water as the solvent, free standing films have been developed. The crystalline/amorphous nature for both *Withania*