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Experimental and theoretical approach for estimation of dry deposition of acidifying compounds to marble

R. Kumar, K. M. Kumari and S.S. Srivastava, Department of Chemistry, Faculty of Science, Dayalbagh Educational Institute, Dayalbagh, Agra-282005. Ph: 0562-212154, Fax: 0562-2121226.

Department of Chemistry, Faculty of Science, Dayalbagh Educational Institute, Dayalbagh, Agra-282005. Ph: 0562-212154, Fax: 0562-2121226.

ABSTRACT

Increasing industrialization and urbanization has resulted in release of pollutants of environmental concern. SO2, NO2, HNO3, SO42- and NO3- are major acidifying components which are detrimental to ecosystems and monuments and potent for stone decay processes. Because of the solubility of their products they are dissolved in rain water and dew drops and penetrate into the inner pores of material. After the evaporation of water drops, these salts redeposit and give rise to stress in the buildings, which causes their deterioration. Dry deposition is an important mechanism in this regard, which is most relevant but least studied due to unavailability of suitable methods. In the present study atmospheric input of S and N compounds to marble has been determined at Dayalbagh, Agra using surface washing method and an alternative parameterization method based on meteorological parameters viz., temperature, solar radiation, wind speed, wind direction and relative humidity. Dry deposition obtained experimentally and theoretically are comparable.