87Sr/86Sr and major ion composition of rainwater of Ahmedabad, India: Sources of base cations

Jayati Chatterjee*, Sunil Kumar Singh
Geosciences Division, Physical Research Laboratory, Navrangpura, Ahmedabad 380009, India

Highlights
- Chemical composition and Sr isotopic ratio are measured in rainwater samples.
- Chemical composition of rainwater display decadal variation.
- Sr isotopic ratio has been used to trace the sources of base cations for the first time in the Indian subcontinent.
- Base cations in the rainwaters of the Ahmedabad are derived from carbonates and basalts in addition to seawater.

1. Introduction
The rainwater chemistry has been important for its use to investigate the atmospheric conditions and the concentration of the soluble components, especially at present time when the anthropogenic activities are changing the atmospheric environment at an ever-increasing pace. Rainwater acquires dissolved cations and anions from the dissolution of gaseous and particulate material present in the atmosphere which could be of natural or anthropogenic origin. Cations such as Ca, Mg and anions such as HCO3 are derived from the soil dust present in the atmosphere whereas SO4 and NO3 could come from anthropogenic sources in addition to natural precursors. There have been a number of studies of the wet deposition in the Indian subcontinent to deal with the chemical components and to understand their characteristics (Saxena et al., 1996; Kulshrestha et al., 1999, 2009; Safai et al., 2004; Rastogi and Sarin, 2005). It has been observed that in Indian region the rainwater are mostly alkaline in nature due to abundance of primary aerosols (Ca, Mg and K) originating from the dusty soils (Kulshrestha et al., 2003; Chandra Mouli et al., 2005). Also there have been studies to detect the crustal influence on rainwater (Jain...