



Stable isotope study in East Antarctica

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Stable isotope ratios can be used to reconstruct past environmental conditions. Similarly for ecosystems, the isotopic composition of soil organic matter reflects the plant material that occupied the surface in the past. Another very common application of stable isotopes is as tracers to identify where materials had originated. This is a particularly powerful approach in atmospheric studies, where the interest is to identify which terrestrial surface (e.g., ocean versus land) or which terrestrial ecosystem (e.g., grassland versus forest) is contributing to or removing a gas species from the atmosphere. This study used hydrogen and oxygen stable isotopes in climate change research in polar area. The measurement of the stable isotopes was carried out with the gas isotope ratio mass spectrometer. The study area was Antarctica between Grove Mountains ($73^{\circ}06'01''$ S; $75^{\circ}14'13''$ E) and the coastal area with the coordinates $69^{\circ}23'16''$ S; $76^{\circ}22'47''$ E. The 39 samples consisted in ice and snow. The ice and snow were sampled by Negoita in February 2003 on the straight line of 500 km from the first coordinate. The sampling points were established at each 12.82 km on this straight line. The samples shown a deuterium content in excess with negative values. These values ranged from -30‰ to -60‰ . The negative values for the excess of deuterium mean the evaporative origin of the samples. We have concluded, based on the variation of the D and ^{18}O for the ice and snow samples collected in Antarctica, that the origin of the precipitation is an evaporative one. We have correlated the $\delta^{18}\text{O}$ and δD with the air temperature in the area where the precipitation occurred. The diminution of the temperature is proved by the decrease of the $\delta^{18}\text{O}$, δD values on the Grove Mountains. To perform a whole study on the areas in Antarctica, we need more

samples and we need to extend the measurements on the ^{13}C and ^{15}N isotopes. We further intend to study the soil, plants and the air in this area using the ^{18}O , D, ^{15}N and ^{13}C .