



同位素地球化学国家重点实验室
State Key Laboratory of Isotope Geochemistry

学术报告

Source Enrichment Processes Responsible for Isotopic Anomalies in Oceanic Island Basalts

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报告时间：**1月25日(周四)上午10:00**

报告地点：**标本楼一楼会议室**



Mckenzie 教授，国际著名地球物理学家，1942 年生于英国切尔南特，毕业于英国剑桥大学金学院，1963 年获学士学位，1966 年获硕士和博士学位，自 1965 年起在剑桥大学地质系工作至今。上世纪 60~70 年代，他与 **William J. Morgan** 和 **Xavier Le Pichon** 共同倡导板块构造学说，是板块构造学说的先驱之一。之后所做的地幔对流研究，是人类对地球内部认识的开端。发表论文 200 多篇，在地球物理学、大地构造学、地球化学等领域作出了杰出的、开创性的贡献。研究区域从地球延伸到金星和火星。

报告摘要:

Various schemes have been proposed to classify the isotopic observations from OIBs, but it is not clear whether any of them reflect the processes that produce the fractionation between parent and daughter elements. The obvious way forward is to use the correlation between isotopic ratios and elemental concentrations to extract the composition of the enriched material. But doing so is not straightforward for several reasons.

The mantle is surprisingly inhomogeneous, and, if more than two sources contribute to the composition of the melt, it is difficult to use the observations to disentangle the effects of magma mixing. Some of the larger oceanic islands are underlain by plumes, where the upwelling velocities reach 0.5 m/a. Therefore the composition of the material undergoing melting may change on a time scale as short as 10,000a. Another problem concerns the accuracy of the isotopic measurements, which may need to be made on samples as small as individual olivine melt inclusions.

The necessary measurements have now been made on a number of sample suites, in particular on post-glacial basalts from Iceland erupted in the last 10 ka. These show that the centre of Iceland is dominated by EMORB enrichment, in contrast to magmas from the far northeast and southwest, which have signatures like those of basalts from Reunion and model ages of about 400 Ma. The Icelandic data shows the importance of determining the composition of the enriching material from magmas that are erupted in a limited area in a short time interval. In SW Iceland there is no correlation between elemental concentrations and isotopic ratios from whole rock samples, but there is between ion probe measurements on melt inclusions.