

EVALUATION OF SUITABILITY FOR K-Ar DATING

1. INTRODUCTION

A sample of basalt chips from a sidewall core from Chat#1, 3050.95m, was received from Bridge Oil Ltd. with a request to carry out a K-Ar age determination.

2. PROCEDURES

A thin section was prepared from several rock chips after the drilling mud had been washed off and examined for suitability for K-Ar dating.

The petrographic description is given in the following section, where it is noted that due to the presence of alteration products, the sample is unsuitable for dating.

3. PETROGRAPHIC DESCRIPTION

Chat#1, 3050.95m: TS45913

Rock Name: Olivine Basalt

The thin section was prepared from several chips up to 1 cm in size and the mineralogy is fairly consistent in all chips. The rock is a porphyritic olivine basalt containing about 10% of phenocrysts (altered? olivine) in a groundmass composed of plagioclase, pyroxene, opaques, minor glass and other intergranular material that may represent altered glass.

The phenocrysts are generally ~0.25 mm in size. In one chip, the phenocrysts are relatively fresh olivine but in all other chips, the phenocrysts are replaced by intergrowths of chlorite and serpentine minerals. Some glomero-porphyritic aggregates are present. Rare plagioclase phenocrysts were noted in one chip.

The groundmass consists of plagioclase laths, often quite elongated (e.g. 1 mm) but ranging down to less than 0.1 mm. In some chips the plagioclase laths have a random orientation while in others, a weak fluidal texture is present.

The interstices between the plagioclase laths are filled with finely granular pyroxene (usually ~20 microns in size and rarely exceeding 60-70 microns).

Another common interstitial phase is a brown chlorite mineral which may represent altered glass. Undevitrified glass was noted only in one chip.

Although the plagioclase and pyroxene are fresh, the abundance of interstitial chloritic alteration makes this rock unsuitable for isotopic dating. The rock is too fine grained to permit mineral separation of plagioclase to be attempted and, in any case, the sample is much too small for this to be considered.

The presence of interstitial alteration is a critical factor in determining the suitability of a volcanic rock for dating. This material represents a late phase of crystallisation and usually contains a higher concentration of potassium. Any alteration of this phase will destroy the argon retentivity of the rock.