Crustal contamination and magma mixing in basic volcanic rocks from NW Iran: Evidence from textural and chemical disequilibria in phenocrysts and glasses

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Basic volcanic province of north western Iran consists dominantly of alkali basalts and trackyandesites. We present the results of detailed petrographic and geochemical investigations on the basaltic rocks. A variety of features suggest that the lava flows were contaminated by upper crustal materials along their way from magma chamber onto the surface. In addition, the effects of magma mixing and mingling between the end member tackybasalt and basalt composition, which ultimately resulted in the production of intermediate magmas, are discussed in the studied samples. Evidence for crustal contamination and magma mixing include the xenocrystic phases, the reversed zoning patterns in minerals, sieved textural zones in feldspars, resorption embayment. In the glassy matrix, there are some evidences for co-mingling of basic and intermediate magma such as existence of K-feldspars in matrix of basaltic samples and two different glasses adjacent together.

Thiobarbituric-acid reactive substances (TBARS) response curves in the presence of 1:1 and 2:1 phyllosilicates

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Clays catalyze chemical reactions including acid hydrolysis, condensations, oxidative polymerizations, etc. Here the authors propose that properties such as the content and structural distribution of structural Fe in expandable (e.g., hectorite, nontronite) or non-expandable (e.g., kaolinite) clay minerals influence the mechanism(s) and production rate of $^{\bullet}OH$ radical species in suspension, which can alter the chemical composition of biological material. The measurement of Thiobarbituric Acid Reactive Substances (TBARS) has become the method of choice for screening and monitoring lipid peroxidation, a major indicator of oxidative stress. The assay provides important information regarding free radical activity in disease states and has been used for measurement of anti-oxidant activity of several compounds and to determine lipid peroxidation. TBARS analyses for kaolinite, hectorite, and nontronites NAu-1 and NAu-2 showed variations in amounts of lipid peroxidation. The response followed the order kaolinite (0.42 nmol/mg protein), NAu-1 (1.15), hectorite (3.35), and NAu-2 (11.1). As determined by TBARS assays, clay properties including expandability, structural iron content and distribution, were found to influence the $^{\bullet}OH$ production rate. The effect of UV light incidence (λ = 540 nm) was found to be of little influence.