5.6.P13

Age and Sr-Nd-Pb isotope characteristics of the Mid Atlantic Ridge gabbro-peridotite complex

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The collection of samples for absolute age determination by isotope-geochronological methods is made up by 12 samples of the best preserved rocks (gabbro-norite, dolerite, metaperidotite) from the gabbro-peridotite complex of the rift zone along MAR. The upper interception of discordia constructed on zircon single grains of gabbro-norite sample (13°N) corresponds to the age 831±98 Ma (TIMS). Analyses of apatite from another metagabbro-norite sample are subconcordant and average weighted age estimation reveals the time of 45.5±1.2 Ma. 3 elongated prismatic grains of transparent zircon of magmatic genesis correspond to concordant age 299.5±0.1 Ma (gabbro-norite, 16°N), whereas concordant age of one more round-shape zircon grain from this sample is 705.4±0.3 Ma. Additional coarse-grained norite sample from this region contains two long-prismatic transparent grains of zircon with the subconcordant age of 772.1±1.2 Ma and strongly discordant age 827.8±9.6 Ma. 6 transparent colorless zircon particles from metagabbro samples (13°N) of irregular shape and with the traces of prismatic facets reveal concordant age 1.721±0.025 and 2.231±0.075 Ma. Whereas angular fragments of metaperidotite zircon with high Th content have concordant age close to 300 Ma (SHRIMP). It is obvious that the investigated samples cannot be considered as homogeneous group and there is no sense to apply Sm-Nd isochron model. But, trend built for the whole number of points (n=15) has the slope corresponding to the age 410±130 Ma (ENd=+8.3). Mineral isochrones built for rock-forming minerals and whole rock sample for gabbro-dolerite, gabbro-norite, metagabbro and metadolerite reveal the ages 423, 408, 419 and 720 Ma. Primary Nd isotope composition calculated to the age 400 Ma varies within 2 ENd from +6.6 to +8.8 which is evidence of some heterogeneity of mantle source for this region of MAR. Rb-Sr system in the samples is disturbed in different degree, probably due to reaction with the oceanic water. Nevertheless, isochron constructed for 10 analyzed samples (without serpentinite samples) determines the age 406±30 Ma and Sri=0.7024. At the same time mineral isochrones for gabbro and metadolerites correspond to the age 448.6, 398 and 444 Ma with primary Sr isotope composition varying from 0.70222 to 0.70235. The carried out investigation proves the participation of Precambrian material in formation of gabbro-peridotite rocks within the MAR.

5.6.P14

Statistical estimation of the geophysical fields and basalt assemblages distribution in the Central Atlantic

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The calculation of K-means clusters for basic geophysical parameters (Bouguer and isostatic anomalies, heat flow, Love waves tomography on 35 s periods, bottom topography and thickness of sediments), indicating geodynamical state of oceanic crust and available at equal spacing on 1° grid was done. Distribution of clusters (fig.1) shows the presence of symetry violation by plum diapirism and significant variance of conditions along ridge axis. The quantitative description of clusters (fig.2) shows, that strong value of deep heat flow is not responsible for main diversity of crust structures and occupies discrete positions on the ridge. These positions correlates with Spreading (SA) and Plume (PA) basalt Assemblages.