BULK MINERALOGY OF THE AEGEAN SEA SURFACE SEDIMENTS

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Abstract: The North Aegean Sea sediments are mostly terrigenous with substantial quantities(5-35%) of carbonate minerals.Most of the terrigenous sediments are transported into the region by the North Aegean Sea rivers.The South Aegean Sea sediments contain generally from 20-40% carbonates and enhanced proportions of minerals of volcanic origin.

Résumé: Les sédiments de la mer Egée du Nord sont très terrigènes avec de substantielles quantités de minéraux carbonatés(5-35%). La plupart des sédiments terrigènes sont transportés dans la région par les rivières de la mer Egée du Nord. Les sédiments de la mer Egée du Sud contiennent,en général, 20 à 40% de carbonates et des proportions enrichies de minéraux d'origine volcanique.

The X-ray bulk mineralogies of about 200 surface sediments from the Aegean Sea have been studied.Several of these samples have been collected analysed and kindly made available to us by the Hellenic Hydrographic Service.

The Northern Aegean Sea sediments contain from 5-35% of carbonates. The main carbonate minerals are calcite and Mg-rich calcite.Sediments from the Thermaikos plateau contain mainly calcite which is also the dominate carbonate mineral of the deeper than 60m surface sediments of the North Aegean Sea.Mg-rich calcite is enriched in the sediments of the deep North Aegean Sea Trough and also represents the main carbonate mineral in the Limnos plateau.The existing higher proportions of Mg-calcite and Aragonite in the sediments deposited above the shelfbreak are often related to the existence of relict biogenic sediments.Generally Aragonite and dolomite are found only in minor quantities with the exception of shallow areas.The non carbonate minerals dominate in the Northern Aegean Sea.The vast amount of terrigenous sediment is due to the sediment load transported into the sea by the Aliakmon,Loudias,Galikos,Strimonas,Nestos and Evros rivers.Quartz,micas and feldspars

dominate the terrigenous minerals which locally can be significantly enriched in other constituents of local origin.

The South Aegean Sea sediments contain generally from 20-40% carbonates.The dominate carbonate minerals are Mg-rich calcite,calcite and aragonite.Dolomite is found only in minor quantities.The enhanced proportons of Mg-rich calcite and aragonite found in the Cyclades plateau or the shelf areas surrounding the Aegean Sea islands, above or nearby the shelf break, are related mostly to relict biogenic faunas.The deep sediments contain mainly calcite and Mg-rich calcite.The non carbonate minerals of the South Aegean Sea contain quartz and enhanced proportions of feldspars and other unstable minerals (amphibolles,pyroxenes) mainly of volcanic origin.The Turkish rivers do not appear to transport any significant amounts of sediments into the southeastern Aegean Sea shelf.

The surface sediments of the Aegean Sea contain major quantities of inorganic amorphous material,ranging from 5-85%.If this is taken into account,then most of the Aegean Sea sediments plot within the recycled orogen provinces of the QFL diagram(Dickinson and Suczek,1979).However a few samples from the North Aegean plot well within the magmatic arc provenances.Most of the samples from the Aegean Sea plot above the 50% Q line of the QPK diagrams suggesting sediments of increasing maturity or stability from continental block provinces.However this is not true since these three minerals are only exceptionally the predominate components.Despite this it is noteworthy to remember that most of the samples from the Aegean plot close to the line from the quartz pole to the mid-point of the P-K line,which seperates the samples with a predominant Volcanic component and those with an increased plutonic element.This is suggesting intense reworking of the surface sediments by dynamic depositional processes.Only areas with a direct supply of sediments with predominate Volcanic or Plutonic component are clearly distinguished.

REFERENCES

Dickinson,W.R. and Suczek,C.A.,1979.Plate tectonics and sandstone Compositions.Amer. Assoc. Petr. Geol. Bull. Vol. 63,No.12,pp.2164-2179.