Geoanalysis and Geochemical Data Processing

C.R.M. Rao in his keynote address stressed the importance of fratogel immobilized 8-hydroxy quinoline resin in the effective concentration of certain trace metals in sea water. T. Suryanarayana in his keynote address emphasized the need for development of a statistical tool to check consistency in geochemical data and analysis. A.V. Chugaev presented new Sm-Nd and Rb-Sr data on the Champion Reef of Kolar Gold Fields, identifying two separate events corresponding to the time of vein formation and later cooling. V. Balaram highlighted the role of NGRI as a centre of excellence in the field of economic geology. Y.J. Bhaskar Rao gave an overview of the application of laser ablation multicollector ICP-MS in cosmochemistry, geochronology, isotope geology, mineral exploration, as well as sedimentary and environmental geochemistry. P.S. Jain discussed the latest advances in ICP technology and B. Joseph proposed a new chemical index of weathering as a tool to asses the degree of weathering. B. Kumar stressed the urgent need to set up a national facility at NGRI for hydrocarbon exploration using multi-disciplinary studies. K. Chandra Sekhar discussed the factors that control the mobility, transformation and accumulation of toxic phases of heavy metals in the ecosystem.

Environmental and Experimental Geochemistry

A.K. Shyam in his keynote address highlighted the various methods of storage/disposal of coal-ash and emphasized the need for detailed geological studies in locating suitable disposal sites for accumulation of ash, and for monitoring the quality of groundwater at such sites. G.L.N. Reddy reported the abnormally high concentration of U and Th in the soils, lake sediments and granites from Hyderabad and their health hazards. R. Srinivasan observed that the granitoids of the western part Hyderabad are enriched in radioactive elements. Shakeel Ahmed dealt with the application of statistical methods in determining the priority of monitoring wells in fluoride-rich aquifer zones.

Concluding Session

The President, ISAG summarized the proceedings of the symposium and sought the views of the participants. S.M. Naqvi stressed the need for more application-oriented studies for the economic development of our nation and pointed out that the mind-set of the scientists has to be reoriented accordingly. Kuldeep Chandra focused on studies related to modelling in mineral exploration, petroleum geochemistry and related fields. Dhana Raju highlighted the lack of expertise in various aspects of polymetal deposits, ore beneficiation etc. K. Surya Prakash Rao pleaded with the scientific community that such conferences should also bestow their attention for updating syllabi according to changing conditions and demands of the universities to help the student fraternity in their academic pursuits and employment.

National Geophysical Research Institute P. RAMA RAO
Hyderabad - 500 007

BOUGUER ANOMALIES OVER THE CONTINENTS AND OCEANS

Why, in general, the Bouguer gravity anomalies are negative in continental areas and positive in oceanic areas? Extending the question further, why the predominant negative and positive anomalies respectively correspond to the mountain peaks and ocean depths? Although the Bouguer gravity data are not brought on to an even datum, there is fairly a good inverse correlation of Bouguer anomalies with height/depth as well as seismic data. This obviously indicates the excess mass reflected as gravity lows and the deficit mass as gravity highs with respect to the geoid/ellipsoid surface. This is in contrast to the theory of the gravity field which is proportional to the excess or deficit mass. Mathematically speaking, the observed anomalies are proportional to the vertical gradient of gravity, indicating excess mass above the geoid as gravity lows and deficit mass below the geoid as gravity highs. If this were true, far reaching implications arise in the understanding of the theory and interpretation of Bouguer anomalies.

This question is raised because of the conflicting versions about the role of datum in the theory of Bouguer anomaly by Dobrin, Willliam Lorie and Ervin. This controversy arises because of uncertain datum and conventional plotting of anomalies with respect to the horizontal datum and comparison of anomalies with elevations. This may be overcome by applying free air correction factor to all the anomalies for a constant height, in free air, as in the case of airborne surveys. The validity

of the theory of Bouguer anomalies holds good on an even datum or at a constant height, only when the normal gravity anomaly, free air gravity anomaly and Bouguer anomaly are nearly parallel. The background levels are to be separated by an amount equivalent to free air correction factor between normal gravity and free air anomalies and by Bouguer correction factor between free air and Bouguer anomalies.

90, Kirlampudi Layout
Visakhapatnam - 530 017

M. KESAVAMANI

DISCUSSION

OCCURRENCE OF UPPER OLIGOCENE-LOWER MIOCENE ROCKS IN THE UPPER CONTINENTAL SLOPE, OFF THE SOUTHERN PART OF CAUVERY BASIN by Gaitan Vaz and P. Vijaykumar. Jour. Geol. Soc. India, v.57, 2001, pp.141-147.

Yamuna Singh, Atomic Minerals Directorate for Exploration and Research, Begumpet, Hyderabad - 500 016 comments:

The authors may kindly clarify the following points:

Materials and Methods

1. The authors have stated that mineralogical constituents of the studied rocks were determined by X-ray diffractometry (XRD). However, radiation used for this purpose, along with instrumental parameters, has not been mentioned in the paper.
2. The authors have mentioned that they have collected greenish grey sediments for study, but the mineralogical constituents of these sediments have not been described anywhere in the paper.

Results

1. Siève-like texture (Fig.3C) is stated to be due to the presence of clastic and micritic particles. What is the nature of clastic particles? Whether quartz and calcite form the clastic particles? If so, whether calcite is considered detrital?
2. It is not clear that how from X-ray diffractograms (Figs. 4 and 5) the authors have estimated abundances (given up to 1%) of different mineral constituents? These estimates are fraught with many inconsistencies.
3. Intensity (visual) of dolomite reflections in both the diffractograms (Figs.4 and 5) appears to be more or less equal. However, assuming that the visual intensity (even though it is not correct way) of various constituent minerals was a guiding factor in estimating their relative abundances, dolomite content is estimated to be 60% (for limestone) from Fig.4, as against 47% (for ferruginous envelope) from that of Fig.5. Also, intensity (visual) of calcite reflections in both the diffractograms (Figs.4 and 5) again looks to be nearly equal, but contrasting abundances of calcite have been estimated, i.e., ~10% from Fig.4 and 1% from Fig.5. Similarly, estimates of pyrite and goethite abundances also do not seem to have consistency with respect to their visual intensities.
4. Unlike other mineral reflections (Figs.4 and 5), why only one reflection of carbonate fluorapatite (CAF) has been marked in both the diffractograms? Whether other reflections of CAF are absent? Even though there is a noticeable variation in visual intensity of (only one marked) reflection of CAF (*see* Figs.4 and 5), the abundance of CAF is estimated to be equal in both the cases i.e., in the limestone (~8%) as well as in the ferruginous envelope (8%). The fact that CAF content is greater in ferruginous envelope is also clearly indicated by its higher content of P_2O_5 (8.70%) (*see* Table 1) than in limestone (5.40%).
5. Chemical composition of limestone and ferruginous envelope (Table 1) vis-a-vis their mineralogy does not seem to have been properly evaluated. Is there any influence of the observed fossil assemblage on the mineralogy and geochemistry of the host limestone and its envelope?