DOWNLOAD PDF TECTONOMAGMATISM GEOCHEMISTRY AND METAMORPHISM OF PRECAMBRIAN TERRAINS

Chapter 1 : Yellowstone REU

Tectonomagmatism, Geochemistry and Metamorphism of Precambrian Terrains Tectonomagmatism, Geochemistry and Metamorphism of Precambrian Terrains Janardhan, A.S. XI), and tourist resources, are important aspects of the economic activities and potential of the delta.

Publications Refereed Papers Naha, K. An example of syngenetic tungsten deposit, Ind. An example from Zawar area, the Aravalli Mountain. African Earth Sciences, v. R Tectonic implication of Geochemistry of gabbro -norite -basic granulite suite in the Proterozoic Delhi Supergroup, Rajasthan, India. A study from its western margin in Balangir and Nawapara districts of Orissa. Contrast in deformational history of Aravalli and Delhi Supergroup: Tectonomagmatism, Geochemistry and Metamorphism of Precambrian Terrains. Procceding volume on the National seminar, Udaipur, pp. Gondwana Geological Magazine, Spl. Evidence from meso, micro-structures, Proc. Sarkar, Sunayana and Biswal, T. KusumaRemote sensing study of granulitic terrain in parts of Gujarat and Rajasthan,, Photonirvachak,J. Indian Society of Remote Sensing,Vol. A new kinematic interpretation, Current Science, V. Macmillan Publishers, New Delhi. Indian Journals of Geosciences, 63 2 pp. Journal of Asian Earth Sciences, vol. Implications for the Mesoproterozoic supercontinent. Papers in Conferences T. Biswal- Structural and geochemical evidence of a continental arc setting in the granulite-charncokite rocks of Delhi Supergroup, Balaram-Mawal area, Aravalli Mountain, Gujarat International Symp. On charncokites and granulite facies rocks Held in Chennai, , pp. Sinha- Fold-thrust belt structure of the Eastern Ghats Mobile belt,a line of correlation between India and Antarctica in the Gondwanaland. Gondawana 11 held at Christchurch, New Zealand, Ahuja- Structural setting of nepheline syenites in the Eastern Ghats Mobile Belt, India, its implication for correlation with Antarctica. Gondwana 12 held at Mendoza, Argentina, A study from its NW margin. Biswal,, Harish Ahuja, S. Patil, Kumarvel and E. Chandrasekhar New Neoproterozoic Pole for India: Thirukumaran, Krishanu Bandyopadhyay and Mary S. Kamleshwar Ratre and Tapas Kumar Biswal Tapas Kumar Biswal and Kamleshwar Ratre Geological Society of Australia, Abstract no. Tectonic implication of the deformational structures of the Ambaji Basin, Delhi Supergroup, NE Gujarat, in relation to the neighboring high grade terrane. Biswal, Y K Singh, S. Yengkhom, Vinee Srivastava Tectonic activitites related to landslide studies. National conference on Geomatics in Disaster Management. Palaeostress analysis for kink bands developed in the podiform granulite terrane of the South Delhi fold belt around Surpagla, Sirohi District, Rajasthan. Climate Change, , 3. Brittle and ductile deformational structures in Tectonic zones: The research trends in India. Biswal, Bor-ming Jahn, M.

DOWNLOAD PDF TECTONOMAGMATISM GEOCHEMISTRY AND METAMORPHISM OF PRECAMBRIAN TERRAINS

Chapter 2 : Pre Syllabi | calendrierdelascience.com's IAS Institute

The terrain as a whole has witnessed the Ma old granulite event. The granulite metamorphism took place under temperatures of Â°C and at pressures of to 5 Kbar. Read more.

Twelve representative rock samples were selected for thin section petrography and bulk rock geochemical analysis. The results reveal that the dominant intrusive rocks in Okom-Ita area are pegmatites, quartz veins and dolerites emplaced within gneisses, schists and phyllites host rocks. The quartz veins and pegmatites are leucocratic consisting predominantly of quartz, plagioclase and subordinate amount of Muscovites. The dolerite is dark grey, fine to medium grained and texturally ophitic and consists dominantly of pyroxenes, olivine and opaques. Three varieties of gneisses were recognized: These distribution trends suggest a compensation for the high silica and alumina concentrations and support a granitic protolith for the pegmatites and their host gneisses and schists. The dolerites and amphibolites are impoverished in SiO2, but relatively enriched in lime and alkali oxides. Introduction Nigeria lies in the Pan-African mobile belt, being sandwiched between the West African Craton to the west, eastern Saharan Craton to the northeast and the Gabon-Congo Craton to the southeast [1]. It is underlain by crystalline Basement Complex and sedimentary rocks. The Nigerian Precambrian rocks have been grouped into two based on age and composition: The Oban Massif area in the southeastern part of Nigeria is underlain by some of these Basement Complex rocks. The area is a part of the giant spur that represents the western prolongation of the Cameroun Mountains into the Cross River plains of southeastern Nigeria Figure 1. In fact the Oban Massif is a deeply dissected plateau which in places attains a height of m above mean sea level [3]. The determination of the composition of rocks in Okom-Ita area using X-Ray fluorescence spectrometry and thin section petrography became necessary to obtain more comprehensive geological information of the study area. And combining the geological information with a detailed chemical classification of rocks in the area using Figure 1. Generalized geological map showing the Pan-African Belts of Nigeria and the location of the southeastern Nigerian Basement Complex [7]. Geological Setting The geological map of Nigeria shows that the Basement Complex can distinctively be divided into two zones: Like the Precambrian of Africa, two models have been proposed: The mix-up of rocks lacking a systematic variation and the virtual absence of truly miogeosynclinal sediments until upper Precambrian times do not favor a plate tectonic model of evolution of the Nigerian Basement Complex [5]. Conversely, [6] suggested that the Basement Complex of Nigeria formed as a result of the opening and closing of a small ocean comparable to the Red Sea. Other researchers inferred that the Pan African belt in the east of the West African Craton is a collision-type orogeny with an eastward dipping subduction zone [8] -[10]. According to them, the closure of the ocean at the craton margin and the intracontinental basins and oceans led to the deformation and metamorphism of the metasediments, partial melting of the mantle and lower crust and the emplacement of the Older Granites. In the Oban Massif, the Basement Complex rocks is dominated by the Uwet granodiorite and charnockite masses which intruded a sequence of schists similar to those described from southwestern and northwestern Nigeria [3]. The scholars who had studied the petrology of Obudu and Oban Massifs, including the works of [3] , [11] agreed that a great similarity exists in characteristics of both massifs. The rocks of the Oban Massif are comprised of the following suites: In the Okom-Ita area the dominant intrusive rocks are the pegmatites, quartz veins and dolerites emplaced within the gneiss, schist and phyllite host rocks [3]. Methodology Twelve 12 representative fresh rock samples were systematically selected from a total of thirty nine 39 samples collected during the field mapping for laboratory analysis. Bulk rock geochemical analysis was carried out using X-Ray fluorescence spectrometry at the geochemistry laboratory of the Technical University of Berlin, Germany. Each of the samples was first crushed and powdered. Fused discs and pressed beads were thereafter produced for major and minor element analyses.

DOWNLOAD PDF TECTONOMAGMATISM GEOCHEMISTRY AND METAMORPHISM OF PRECAMBRIAN TERRAINS

Chapter 3 : Metamorphism, Magmatism/Igneous and Crustal Evolution

select article Tectonomagmatism, Geochemistry and Metamorphism of Precambrian Terrains Book review Full text access Tectonomagmatism, Geochemistry and Metamorphism of Precambrian Terrains.

Syllabus Section A Mineralogy Classification of crystals into systems and classes of symmetry. International system of crystallographic notation. Use of projection diagrams to represent crystal symmetry. Elements of X-ray crystallography. Petrological microscope and accessories. Optical properties of common rock forming minerals. Pleochroism, extinction angle, double refraction, birefringence, twinning and dispersion in minerals. Physical and chemical characters of rock forming slilicate mineral groups. Structural classification of silicates. Common minerals of igneous and metamorphic rocks. Minerals of the carbonate, phosphate, sulphide and halide groups. Igneous ad Metamorphic Petrology Generation and crystallisation of magma. Crystallisation of albite-anorthite, diopside-anorthite and diopside-wollastonite-silica systems. Petrogenetic significance of the textures and structrues of igneous rocks. Petrography and petrogenesis of granite, syenite, diorite, basic and ultrabasic groups, charnockite, anorthosite and alkaline rocks. Types and agents of metamporphism. Metamporphic grdes and zones. Facies of regional and contact metamorphism. Textures and structures of metamporphic rocks. Metamorphism of arenaceous, argillaceous and basic rocks. Minerals assemblages Retrograde metamorphism. Metasomatism and granitisation, migmatites, Granulite terrains of India. Clastic and non-clastic rocks-their classification, petrography and depositional environment. Sedimentary facies and provenance. Sedimentary structures and their significance. Heavy minerals and their significance. Sedminetary basins of India. Section-B Economic Geology Ore, ore minerals and gangue, tenor of ore, classification of ore deposits. Process of formation of minerals deposits. Controls of ore localisation. Ore textures and structures. Metallogenic epochs and provinces. Geology of the important Indian deposits of aluminium, chromium, copper, gold, iron, lead zinc, manganese, titanium, uranium and thorium and industrial minerals. Deposits of coal and petroleum in India. Conservation and utilization of mineral resources. Marine mineral resources and Law of Sea. Mining Geology Methods of prospecting-geological, geophysical, geochemical and geobotanical. Estimation of reserves or ore. Methods of exploration and mining metallic ores, industrial minerals and marine mineral resources. Mineral beneficiation and ore dressing. Geochemistry and Environmental Geology Cosmic abundance of elements. Composition of the planets and meteorites. Structure and composition of earth and distribution of elements. Elements of crystal chemistry-types of chemical bonds, coordination number. Natural hazards-floods, landslides, coastal erosion, earthquakes and volcanic activity and mitigation. Environmental impact of urbanization, open cast mining, industrial and radioactive waste disposal, use of fertilizers, dumping of mine waste and fly-ash. Pollution of ground and surface water, marine pollution Environment protection-legislative measures in India. Lecture Plan 7 Mineralogy Classification of crystals into systems and classes of symmetry; International system of crystallographic notation; Elements of X-ray crystallography. Optical properties of common rock forming minerals; Pleochroism, extinction angle, double refraction, birefringence, twinning and dispersion in minerals. Types and agents of metamorphism; Metamorphic grades and zones; Phase rule; Facies of regional and contact metamorphism; ACF and AKF diagrams; Textures and structures of metamorphic rocks; Metamorphism of arenaceous, argillaceous and basic rocks; Minerals assemblages Retrograde metamorphism; Metasomatism and granitisation, migmatites, Granulite terrains of India. Processes of formation; digenesis and lithification; Clastic and non-clastic rockstheir classification, petrography and depositional environment; Sedimentary facies and provenance; Sedimentary structures and their significance; Heavy minerals and their significance. Natural hazards-floods, mass wasting, costal hazards, sea-level changes: In this Crash Course, topics which are generalized and basic are not covered due to paucity of time.

Chapter 4 : Precambrian Research - Journal - Elsevier

The geochemistry of the dark granulites suggests a dacitic protolith of probable orogenic (destructive plate margin) setting, implying the presence of a yet unknown belt of oceanic closure in the.

Various parameters and characteristics were suggested for strengthening the idea of densely welded ignimbrites, which differentiate them from lava. Here, a comprehensive study on early Proterozoic acid magmatic rocks forming lower part of the Dongargarh Supergroup, central India, has been made to suggest extensive occurrence of hlgh-grade welded rheomorphic tuffs. The possibility of their being welded ignimbrite rather than lava flow has been explored in the light of facies analysis as well as detailed microscopic evidences. Despite having overall monolithologic look various units bear distinction on account of their nature of welding, enrichment of phenocrysts and degree of stretching. The presence of vitroclastic texture, melt inclusions and radial fracturing of phenocrysts suggests pyroclastic nature of these deposits. Based on these characters four facies - A, B, C and D from bottom to the top zyx respectively, have been identified from field studies around Salekasa. Facies-C represents extremely welded thinly laminated rheomorphic tuffs while lava-like tuffs with an autobreccia carapace is represented by facies D. High to extremely high-grade nature of welding in these deposits suggests a low column-height subaerial plinian to fissure eruption of a very high temperature silicic magma in a continental setting. Rheoignimbrite, Proterozoic, Dongargarh Supergroup, Bijli rhyolites, high-grade welding, pyroclastics. Introduction successions have been reassessed in this line. The mechanism of emplacement and characteristics of these Textural and structural studies of extensive sheets of highly welded lava-like ignimbrites might differ silicic volcanics have been a major field of volcaniclastic significantly with those of non-welded particulate research in recent years. The subject of interest in this pyroclastic flows. In ancient successions, extremely high-grade ignimbrites lava-like ignimbrites , these have been described as tuffolavas or clastolavas high-grade ignimbrite rheomorphic ignimbrite , Fisher and Schmincke, , p. However, with the moderate-grade ignimbrites that have both welded and emerging concept of grade in ignimbrites mainly non welded zones, and low-grade ignimbrites with no depending upon their nature and degree of welding welding and distinct particulate nature. The grading Walker, ; Mahood, , many silicic volcanic parameter corresponds to variability of particle viscosity J. Distinguishing these categories is a major challenge in the field of volcanology due to a spectrum of gradational characters between the lavas and welded ignimbrites. The problems in recognition are again compounded in deformed and metamorphosed terrains. Till date most of the records of high-grade ignimbrites come from Recent to sub-Recent volcanic provinces and from Phanerozoic successions. The facies characters of ignimbrite deposits from Precambrian metamorphosed successions are relatively poorly known. However, field and textural studies of ignimbrite deposits would likely to throw light on the nature and environmental settings of volcanic activities even from low-grade Precambrian mobile belt successions cf. The rhyolites and rhyodacites of the Paleoproterozoic Bijli rhyolites ca. Geological map of Dongargarh Supergroup modified after grade rheomorphic rhyolitic ignimbrites. Though rhyolitic Sarkar, 1 9 5 8. Gangopadhyay and Ray, , bulk of these silicic zyxw volcanics have been interpreted as lava flows. However, a reconnaissance revealed many variations in texture and organization of these rhyolites that could be interpreted in terms of the pyroclastic nature of these volcanics rather Table 1. Stratigraphic succession of Dongargarh Supergroup after Sarkar et al. In this paper we Unconformity-- attempt a detailed facies analysis of these rhyolitic zyxwvutsrqp Khairagarh Orogenic phase zyxwvut zyxwvutsr pyroclastics and explore their implications for nature, a Kotima Volcanics mode of emplacement, possible source and environmental 5 Ghogra Formation 0 Khairagarh Group Mangikhuta Volcanics zyxwvu p: Textural and petrographic Basal shale Unconformity studies of about 30 selected samples were carried out. It forms a part of the quartz-feldspar biotite gneiss, Bhandara triangle with Sakoli and Sausar Series. Sarkar hornblende schist, and amphibolite. Nandgaon Group includes Bijli Khairagarh, in the ascending order Table 1. The Khairagarh Group is a metasedimentary and metaigneous rocks of amphibolite metasedimentary and metavolcanic assemblage, Gondwana Research, V. Excepting the Amgaon Group the other two groups have mainly undergone a greenschist The rhyolite forms laterally discontinuous small hillocks facies of metamorphism Deshpande et al. Yedekar forming a strike-parallel chain of ridges for several tens et al. Individual mounds range from 60 to lOOm metavolcanics and metasedimentary associations of the in height and to m in width. Apparently in most protocontinent below the northern Bundelkhand instances the rhyolite lacks any particulate texture or zyxwvutsrqp protocontinent. Alternatively, based on the co-magamatic vitroclastic texture, but there are considerable variations rhyolite-anorogenic granite assemblage together with in internal character along and across strike, mainly zyxwvu bimodal rhyolite-basalt assemblage, a continental rift reflected in the form of presence or absence of very well model has been proposed Krishnamurthy et al. However, very careful looks on Besides this, The Bijli Rhyolites at a number of profiles, there are beds of monolithologic breccias and monolithologic matrix-supported coarse ash- Petrology and age to lapilli tuffs. Based on characters such as clast size, clast The Bijli rhyolites are composed of thick stacks of support, internal banding, lamination and vitroclastic rhyolitic volcanics unconformably overlying the gneissic texture, following facies have been identified, rocks of Amgaon Group. The volcanic unit attains a Facies A: CZast-supported welded coarse ash tuff maximum thickness of m Sarkar, These rocks are massive but often show laterally persistent flow layers. This facies is defined by a monolithologic brown to The rhyolitic volcanic unit contains lenses of fragmental dark gray coloured massive rhyolitic rock rich in phenocrysts. The rhyolitic volcanics are dominantly fine-grained and The margins of the clasts are predominantly welded nearly are mineralogically similar, consisting of quartz and obliterating the vitroclastic texture. The clast size long feldspar phenocrysts set in a recrystallized mosaic of axis: These acid not show any preferred orientation. Internally, it is massive but Gangopadhyay and Ray, ; their Fig. A number locally shows incipient crude lamination. Clast-supported welded coarse ash tuff facies A. Diameter of samples of rhyolite with reduced MSWD. Photomicrograph under crossed polars of welded coarse ash tuff, note intense welding of clasts. The vitroclastic texture Fig. Photomicrograph under crossed polars of broken phenocryst with melt inclusion. Matrix-supported welded coarse ash tuff is more evident under microscope with low-illumination w i t h floating lapilli plane-polarized light. Clasts vary from sub-elliptical to This facies is very similar to the facies A in composition. Commonly, the It is also a monolithologic rock made up of lapilli to sand boundaries are wavy or curved and some clasts tend to sized rhyolitic clasts floating within highly welded project into others along the zone of welding. Rinds of monolithologic rhyolitic matrix Fig. This facies define the welding margins that are best distinguished lacks any internal stratification and is massive in under low-illumination plane-polarized light. The clasts have a wide size range from of quartz, plagioclase and potash feldspar, and with euhedral to subhedral outlines occur in the interstices of the clasts. The extent of recrystallisation is overall similar zyxwvutsrqp although minor variation is observed locally. Phenocrysts are mostly broken and fractured with melt-inclusions, centered on radial fractures of the phenocrysts Fig. The boundaries of clasts are attenuated against phenocrysts. Phenocrysts have mostly embayed and irregular margins. Interpretation The prominent vitroclastic texture, observed in the hand specimen as well as under the microscope unequivocally suggests these deposits to be pyroclastics rather than lava flows cf. Henry and Wolff, Abundance of broken, fractured and embayed phenocrysts, phenoclasts and Fig. Matrix-supported coarse ash tuff with floating lapilli. Diameter phenocrysts with fractures radiating from melt-inclusions of the coin is 1. Massive, clast-supported vitroclastic texture further 5x2. The matrix is made up of welded Swanson, ; Fisher, ; Reedman et al. Attenuated clasts, The rhyolitic sand sized grains in the matrix are extremely partial obliteration of interclast boundaries and stretched and show near complete fusion of contacts. The emplacement of a hot semisolid pyroclastic flow cf. Photomicrograph under crossed polars of welded matrix Fig. Flow-laminations in rheomorphic tuff facies C , note planar to [facies B. Length of the pen is 12 cm. Degree of welding of the clasts is largely similar to the facies A. Interpretation This facies with vitroclastic texture comprising lapilli to coarse ash tuff is likely to be a product of pyroclastic flow. The pyroclastic nature is further supported from the fair abundance of broken phenocrysts, phenocrysts with melt-inclusions etc.

Matrix-supported texture together with sub-parallel clast alignment suggests a viscous pyroclastic debris flow within laminar flow-regime cf. Undeformed clasts with sharp margin emplaced in cryptocrystslline matrix are presumably derived from crater wall as cognate components. Presence of these clasts of cognate origin zyxwvutsrqp indicates a greater explosiveness during emplacement of these deposits in comparison to those of facies A. The zyxwvuts matrix of highly bent and welded rhyolite fragments Fig. Eutaxitic to parataxitic texture in rheomorphic tuff. Diameter suggests that emplacement temperature was high enough of the coin is 2. Thinlyflow-laminatedrheomorphic tuff This facies is characterized by uniformly flow-laminated rhyolite without any vitroclastic texture recognizable in hand specimen. The flow laminations, defined by mm- scale recessive surfaces on weathered faces, are mm thick, and planar to wavy in nature Fig. On fresh surface, laminae give an eutaxitic to parataxitic texture Fig. However, locally extremely stretched, folded and curved lenticular fiamme become prominent into differential lamina Fig. The flow laminations are commonly set into flow folds whose geometry and orientation changes rapidly within short distances. The flow are tight plunging to recumbent types and resemble slump folds of soft-sediment deformation Gondwana Research, V. Thinly flow laminated rheomorphic tuff showing extremely stretched, curved and folded clasts. Under crossed polars this facies is predominantly a near- isotopic mosaic of lenticular clasts made up of cryptocrystalline quartz surrounded by somewhat coarser zy microcrystalline quartz rim that defines the clast boundaries and gives rise to avitroclastic texture Fig. The clasts are extremely stretched and nearly completely fused along their margins obliterating the vitroclsatic texture. The broken phenocrysts phenoclasts in parts appear separately surrounded by cryptocrystalline matrix. Interpretation The cryptocrystalline areas are evidently devitrified fiammes with boundary-controlled recrystallized microcrystallinerims. The vitroclastic texture evident from Fig. Flow folds in rheomorphic tuff. Presence of phenoclasts also supports this contention.

DOWNLOAD PDF TECTONOMAGMATISM GEOCHEMISTRY AND METAMORPHISM OF PRECAMBRIAN TERRAINS

Chapter 5 : Optional Geology Crash Course | calendrierdelascience.com's IAS Institute

The Petrology, Geochemistry and mineralogy of the Precambrian rocks around Ikere-Ekiti, southwestern Nigeria was carried out with the aim of assessing the mineral potentials of the rocks. The method of study includes field.

Page 1 of 2 Papers: An example of syngenetic tungsten deposit, Ind. On charnockites and granulite facies rocks Held in Chennai, , pp. An example from Zawar area, the Aravalli Mountain. R Tectonic implication of Geochemistry of gabbro -norite -basic granulite suite in the Proterozoic Delhi Supergroup, Rajasthan, India. Journal of African Earth Sciences 31 1 , pp. Contrast in deformational history of Aravalli and Delhi Supergroup: Tectonomagmatism, Geochemistry and Metamorphism of Precambrian Terrains. Proceeding volume on the National seminar, Udaipur, pp. A study from its NW margin. Rodinia, Gondwana and Asia, Gondwana Research v. Rb-Sr age and Sr isotopic composition of alkaline dykes near Mumbai: Journal of the Geological Society of India 62 5 , pp. Gondwana Geological Magazine, Spl. Evidence from meso, micro-structures, Proc. Remote sensing study of granulitic terrain in parts of Gujarat and Rajasthan,, Photonirvachak,J. Indian Society of Remote Sensing,Vol. Indian Journals of Geosciences, 63 2 pp. Macmillan Publishers, New Delhi. Journal of Asian Earth Sciences, vol. Tectonic implication of the deformational structures of the Ambaji Basin, Delhi Supergroup, NE Gujarat, in relation to the neighboring high grade terrane. Geoinformatics in Applied Geomorphology. An evidence of volume loss from ductile shear zone: Implications for the Mesoproterozoic supercontinent. Geospectrum, acb publication, Kolkata. Singh, Ram Chandra, Ashish R. Biswal International Geology Review: The Groundwater modelling and resource management by geological mapping: