

References

References

- Agarwal A. and Chak A. (1991) Havoc in the Himalaya. In: *Floods, flood plains and environmental myths*. Centre for Science and Environment, New Delhi, 23-39.
- Ahmad T., Khanna P. P., Chakrapani G. J. and Balakrishnan S. (1998) Geochemical characteristics of water and sediment of the Indus river, Trans-Himalaya, India: constraints on weathering and erosion. *Jour. Asian Earth Sci* **16**, 333-346.
- Allegre C. J., Birck J. L., Capmas F. and Cortillot V. (1999) Age of the Deccan Traps using ^{187}Re - ^{187}Os systematics. *Earth Planet. Sci. Lett.* **170**, 197-204.
- Allison C.E., Francey R.J. and Meijer H.A.J. (1995). Recommendations for the reporting of stable isotope measurements of carbon and oxygen in CO_2 gas. In: *Reference and intercomparison materials for stable isotopes of light elements*, IAEA, Vienna, 155-162.
- Anantharaman M. S. and Bahukhandi P. C. (1984) A Study of the mineral resources of Mussoorie Syncline, Garhwal Lesser Himalaya. In: *Current Trends in Geology, Sedimentary Geology of the Himalaya* **5**, 191-196.
- Anbar A. D., Creaser R. A., Papanastassiou D. A. and Wasserburg G. J. (1992) Rhenium in seawater: Confirmation of generally conservative behavior. *Geochim. Cosmochim. Acta* **56**, 4099-4103.
- Araguas-Araguas L., Froehlich K. and Rozanski K. (1998). Stable isotope composition of precipitation over southeast Asia. *Jour. Geophys. Res.* **103**, 28721-28742.
- Bartarya S. K., Bhattacharya S. K., Ramesh R. and Somayajulu B. L. K. (1995) $\delta^{18}\text{O}$ and δD systematics in the surficial waters of the Gaula catchment area, Kumaun Himalaya, India. *Jour. Hydrol.* **167**, 369-379.
- Berner E. K. and Berner R. A. (1996) *Global Environment: Water, Air and Geochemical Cycles*. Prentice Hall, New Jersey, pp. 376.
- Berner R. A. and Berner E. K. (1997) Silicate weathering and Climate. In: *Tectonic Uplift and Climate Change*, (Editor: W. F. Ruddiman), Plenum Press, New York, 354-365.
- Bhattacharya A. K., Bhatnagar G. S., Das G. R. N., Gupta J. N., Chhabria T. and Bhalla N. S. (1984) Rb/Sr dating and geological interpretation of sheared granite-gneisses of Brijranigad-Ingedinala, Bhilangana Valley, Their District, U.P. *Him. Geol.* **12**, 212-224.
- Bhattacharya S.K., Gupta, S.K. and Krishnamurthy, R.V. (1985) Oxygen and hydrogen isotopic ratios in groundwaters and river waters from India. *Proc. Ind. Acad. Sci.* **94**, 283-295.
- Bickle M. J., Harris N. B. W., Bunbury J. M., Chapman H. J., Fairchild I. J. and Ahmad T. (2001) Controls on the $^{87}\text{Sr}/^{86}\text{Sr}$ ratio of the carbonates in the Garhwal Himalaya, Headwaters of the Ganges. *The Jour Geol.* **109**, 737-753.
- Biyani A.K. (1998) Geochemistry and Petrogenesis of Sayan a Chatti Mylonitic granite of Higher Himalayan Yamuna Valley, District Uttarkashi - U.P. *Indian. Jour. Earth Sci.* **25**, 29-41.
- Blum J. D., Gazis C. A., Jacobson A. D. and Chamberlain C. P. (1998) Carbonate versus silicate weathering in Raikhot watershed within the High Himalayan crystalline series. *Geology* **26**, 411-414.
- Boeglin J.-L. and Probst J.-L. (1998) Physical and chemical weathering rates and CO_2 consumption in a tropical lateritic environment: the upper Niger basin. *Chem. Geol.* **148**, 137-156.

- Brand, W.A. Avak H., Seedorf R., Hofmann D. and Conradi Th. (1996). New methods for fully automated isotope ratio determination from hydrogen at the natural abundance level. *Isotopes Environ. Health Stud.* **32**, 263-273.
- Brenner I., Bremier P. and Lemarchand A. (1992) Performance characteristics of an ultrasonic nebulizer coupled to a 40.68 MHz Inductively Coupled Plasma Atomic Spectrometer. *Jour. Anal. Atomic Spectrometry* **7**, 819-824.
- Brookins D. G. (1986) Rhenium as an analog for fissiogenic technetium: Eh-pH diagrams (25°C, 1 bar) constraints. *Appl. Geochem.* **1**, 513-517.
- Cerling T. E. (1997) Late Cenozoic vegetation change, atmospheric CO₂, and tectonics. In: *Tectonic Uplift and Climate change* (Editor: W. F. Ruddiman), Plenum Press, New York, 383-397.
- Chabaux F., Riotte J., Clauer, N. and France-Lanord C. (2001). Isotopic tracing of the dissolved U fluxes of Himalaya rivers: Implications for present and past U budgets of the Ganges-Brahmaputra system. *Geochim. Cosmochim. Acta* **65**, 3201-3217.
- Chamberlain C.P. and Poage M. A. (2000) Reconstructing the paleotopography of mountain belts from the isotopic composition of authigenic minerals. *Geology* **28**, 115-118.
- Chang S. and Berner R. A. (1999) Coal weathering and the geochemical carbon cycle. *Geochim. Cosmochim. Acta* **63**, 3301-3310.
- Clark I. and Fritz P. (1997) *Environmental Isotopes in Hydrogeology*, Lewis Publishers, New York, pp. 328.
- Cohen A. S., Coe A. L., Bartlett J. M. and Hawkesworth C. J. (1999) Precise Re-Os ages of organic-rich mudrocks and the Os-isotope composition of Jurassic seawater. *Earth Planet. Sci. Lett.* **167**, 159-173.
- Collins R. and Jenkins A. (1996) The impact of agricultural land use on stream chemistry in the Middle Hills of the Himalaya, Nepal. *Jour. Hydrol.* **185**, 71-86.
- Colodner D.C., Boyle E. A. and Edmond J. M. (1993a) Determination of rhenium and platinum in natural waters and sediments and iridium in sediments by flow injection isotope dilution inductively coupled plasma mass spectrometry *Anal. Chem.* **65**, 1419-1425.
- Colodner D., Sachs J., Ravizza G., Turekian K. K., Edmond J. M. and Boyle E. (1993b) The geochemical cycle of rhenium: a reconnaissance. *Earth Planet. Sci. Lett.* **117**, 205-221.
- Colodner D., Edmond J. and Boyle E. (1995) Rhenium in the Black Sea: Comparison with molybdenum and uranium. *Earth Planet. Sci. Lett.* **131**, 1-15.
- Cooper L. W. (1998) Isotopic fractionation in snow cover. In *Isotope Tracers in Catchment Hydrology*, (Editors: Kendall C and McDonnell JJ), Elsevier Science B.V.: Amsterdam; 119-136.
- Craig H. (1961) Isotopic variations in meteoric waters. *Science* **133**, 1702-1703.
- Creaser R. A., Papanastassiou D. A. and Wasserburg G. J. (1991) Negative thermal ion mass spectrometry of osmium, rhenium and iridium. *Geochim. Cosmochim. Acta* **55**, 397-401.
- Crusius J., Calvert S. E., Pederson T. F. and Sage D. (1996) Rhenium and molybdenum enrichments in sediments as indicators of oxic, suboxic and anoxic conditions of deposition. *Earth Planet. Sci. Lett.* **145**, 65-79.

References

- Crusius J. and Thomson J. (2000) Comparative behavior of authigenic Re, U, and Mo during reoxidation and subsequent long-term burial in marine sediments. *Geochim. Cosmochim. Acta* **64**, 2233-2242.
- Dalai T. K., Trivedi J. R. and Krishnaswami S. (2000) Re geochemistry in the Yamuna River in the Himalaya, Goldschmidt 2000, An International Conference for Geochemistry, Oxford, U.K., *Journal of Conference Abstracts* **5**, Cambridge publications, 329.
- Dalai T. K., Singh Sunil K., Trivedi J. R. and Krishnaswami S. (2001a): Dissolved Rhenium in the Yamuna River System and the Ganga in the Himalaya: Role of black shale weathering on the budgets of Re, Os, and U in rivers and CO₂ in the atmosphere. *Geochimica Cosmochimica Acta* (in press).
- Dalai T. K., Krishnaswami S. and Sarin M. M. (2001b) Major ion chemistry in the headwaters of the Yamuna River System: Chemical weathering and CO₂ consumption in the Himalaya (communicated to *Geochimica Cosmochimica Acta*).
- Dalai T. K., Krishnaswami S. Kumar A. and Trivedi J. R. (2001c): Sr Isotopes in the Yamuna River System in the Himalaya, *Addenda Abstracts: 16th Himalaya-Karakorum-Tibet Workshop (HKTW-16)*, Schloss Seggau, Austria, 4-5.
- Dalai T. K., Bhattacharya S. K. and Krishnaswami S. (2001d): Stable isotopes and in the source waters of the Yamuna and its tributaries: Seasonal and altitudinal variations and relation to major cations (communicated to *Hydrological Processes*).
- Dansgaard W. (1964) Stable isotopes in precipitation, *Tellus* **16**, 436-468.
- Datta P. S., Tyagi S. and Chandrasekharan H. (1991) Factors controlling stable isotope composition of rainfall in New Delhi, India. *Jour. Hydrol.* **128**, 223-236.
- Derry L. A. and France-Lanord C. (1996) Neogene Himalayan weathering history and river ⁸⁷Sr/⁸⁶Sr : impact on marine Sr record. *Earth Planet. Sci. Lett.* **142**, 59-74.
- Derry L. A. and France-Lanord C. (1997) Himalayan weathering and erosion fluxes: Climate and tectonic controls. In: *Tectonic Uplift and Climate Change*, (Editor: W. F. Ruddiman), Plenum Press, New York, 289-312.
- Dessert C., Dupre B., Francois, L. M., Schott J., Gaillardet J., Chakrapani G. and Bajpai S. (2001). Erosion of Deccan Traps determined by river geochemistry: impact on the global climate and the ⁸⁷Sr/⁸⁶Sr ratio of seawater. *Earth Planet Sci. Lett.* **188**, 459-474.
- Devi L. (1992) *Climatic characteristics and water balance* (A study of Uttar Pradesh) Concept Publishing Company, New Delhi, pp. 207.
- Drever J. I. (1997) *The geochemistry of natural waters: Surface and groundwater environments*. Prentice Hall, New Jersey, pp. 436.
- Drever J. L. and Zobrist J. (1992) Chemical weathering of silicate rocks as a function of elevation in the southern Swiss Alps. *Geochim. Cosmochim. Acta* **56**, 3209-3216.
- Edmond J. M. (1992) Himalayan tectonics, weathering processes, and the strontium isotope record in marine limestone. *Science* **258**, 1594-1597.

- Edmond J. M., Palmer M. R., Measures C. I., Grant B. and Stallard R. F. (1995) The fluvial geochemistry and denudation rate of the Guayana shield in Venezuela, Colombia, and Brazil. *Geochim. Cosmochim. Acta* **59**, 3301-3325.
- Edmond J. M. and Huh Y. (1997) Chemical weathering yields from basement and orogenic terrains in hot and cold climates. In: *Tectonic Uplift and Climate Change*, (Editor: W. F. Ruddiman), Plenum Press, New York, pp. 330-351.
- English N. B., Quade J., DeCelles P. G. and Garzione C. N. (2000) Geologic control of Sr and major element chemistry in Himalayan Rivers, Nepal. *Geochim. Cosmochim. Acta* **64**, 2549-2566.
- Epstein S. and Mayeda T. (1953). Variation of $\delta^{18}\text{O}$ content in waters from natural sources. *Geochim. Cosmochim. Acta* **4**, 213-214.
- Esser B. K. and Turekian K. K. (1993) The osmium isotopic composition of the continental crust. *Geochim. Cosmochim. Acta* **57**, 3093-3104.
- Gaillardet J., Dupre B. and Allegre C.J. (1995) A global geochemical mass budget applied to the Congo basin rivers: Erosion rates and continental crust compositions. *Geochim. Cosmochim. Acta* **59**, 3469-3485.
- Gaillardet J., Dupre B., Allegre C. J. and Negrel P. (1997) Chemical and physical denudations in the Amazon river basin. *Chem. Geol.* **142**, 141-173.
- Gaillardet J., Dupre B. and Allegre C. J. (1999) Global silicate weathering and CO_2 consumption rates deduced from the chemistry of large rivers. *Chem. Geol.* **159**, 3-30.
- Galli P. and Oddo N. (1992) Ultrasonic nebulisation in Inductively coupled plasma atomic spectrometry. *Microchemical Journal* **46**, 327-334.
- Galy A. and France-Lanord C. (1999) Weathering processes in the Ganges-Brahmaputra basin and the riverine alkalinity budget. *Chem. Geol.* **159**, 31-60.
- Galy A., France-Lanord C. and Derry L. (1999) The strontium isotopic budget of Himalayan Rivers in Nepal and Bangladesh. *Geochim. Cosmochim. Acta* **63**, 1905-1925.
- Galy A. and France-Lanord C. (2001) Higher erosion rates in the Himalaya: Geochemical constraints on riverine fluxes. *Geology* **29**, 23-26.
- Gansser A. (1964) *Geology of the Himalayas*. Interscience Publishers, London, pp. 289.
- Gardner R. and Walsh N. (1996) Chemical weathering of metamorphic rocks from low elevations in the Himalaya. *Chem. Geol.* **127**, 161-176.
- Garzione C. N., Dettman D.L., Quade J., DeCelles P.G. and Butler R. F. (2000a) High times on the Tibetan Plateau: Paleoelevation of the Thakkhola graben, Nepal. *Geology* **28**, 339-342.
- Garzione C. N., Quade J., DeCelles P. G., English N. B. (2000b) Predicting paleoelevation of Tibet and the Himalaya from $\delta^{18}\text{O}$ vs. altitude gradients in meteoric waters across the Nepal Himalaya. *Earth Planet Sci. Lett.* **183**, 215-229.
- Gat J. R. and Matsui E. (1991) Atmospheric water balance in the Amazon Basin: An isotopic evapotranspiration model. *J. Geophys. Res.* **96** (D7), 13179-13188.
- Gazis C. A., Blum J. D., Chamberlain C.P. and Poage M. (1998) Isotope systematics of granites and gneisses of the Nanga Parbat Massif, Pakistan Himalaya. *Am. Jour. of Sci.* **298**, 673-698.

References

- Ghildiyal B. P. (1990) Soils of the Himalaya. In: *Himalaya: Environment, resources and development* (Editors: N. K. Sah, S. K. Bhatt and R. K. Pande), Shree Almora Book Depot, Almora, 185-193.
- Handa B. K. (1972) Geochemistry of the Ganga River water. *Ind. Geohydrol* **2**, 71-78.
- Harris N. (1995) Significance of weathering of Himalayan metasedimentary rocks and leucogranites for the Sr isotope evolution of seawater during early Miocene. *Geology* **23**, 795-798.
- Harris N., Bickle M., Chapman H., Fairchild I. and Bunbury J. (1998) The significance of Himalayan rivers for silicate weathering rates: evidence from Bhote Kosi tributary. *Chem Geol* **144**, 205-220.
- Hasnain S. I., Subramanian V. and Dhanpal K. (1989) Chemical characteristics and suspended sediment load of meltwaters from a Himalayan glacier in India. *Jour. Hydrol.* **106**, 99-108.
- Hasnain S. I. and Thayyen R. (1999) Controls on the major-ion chemistry of the Dokriani glacier meltwaters, Ganga basin, Garhwal Himalaya, India. *Jour. Glaciol.* **45**, 87-92.
- Hay W. W. (1998) Detrital sediment fluxes from continents to oceans. *Chem Geol.* **145**, 287-323.
- Hodge V. F., Johannesson K. and Stetzenbach K. J. (1996) Rhenium, molybdenum and uranium in groundwater from the southern Great Basin, USA: Evidence for conservative behavior. *Geochim. Cosmochim. Acta* **60**, 3197-3214.
- Hoffmann G. and Heimann M. (1997). Water isotope modeling in the Asian monsoon region. *Quaternary International* **37**, 115-128.
- Horan M F., Morgan J. W., Grauch R. I., Conveney Jr. R. M., Murowchick J B. and Hulbert L. J. (1994) Rhenium and osmium isotopes in black shales and Ni-Mo-PGE-rich sulfide layers, Yukon Territory, Canada, and Hunan and Guizhou provinces, China. *Geochim. Cosmochim. Acta* **58**, 257-265.
- Huh Y., Tsoi M.-Y., Zaitsev A. and Edmond J. (1998) The fluvial geochemistry of the rivers of Eastern Siberia: I. Tributaries of the Lena River draining the sedimentary platform of the Siberian Craton. *Geochim. Cosmochim. Acta* **62**, 1657-1676.
- Huh Y. and Edmond J. (1999) The fluvial geochemistry of the rivers of Eastern Siberia: III. Tributaries of the Lena and Anbar draining the basement terrain of the Siberian Craton and the Trans-Baikal Highlands. *Geochim. Cosmochim. Acta* **63**, 967-987.
- IAEA/WMO (1998) *Global Network for Isotopes in Precipitation. The GNIP Database*. Release: March, 1998. URL <http://www.iaea.org/programs/ri/gnip/gnipmain.htm>.
- Ingraham N. L. (1998) Isotopic variations in precipitation. In *Isotope tracers in catchment hydrology*, (Editors: C. Kendall and J. J. McDonnell), Elsevier Science B.V.: Amsterdam; 87-136.
- Jacobson A. D. and Blum J. D. (2000) Ca/Sr and $^{87}\text{Sr}/^{86}\text{Sr}$ geochemistry of disseminated calcite in Himalayan silicate rocks from Nanga Parbat: Influence on river-water chemistry. *Geology* **28**, 463-466.
- Jaffe L. A., Peucker-Ehrenbrink B. and Petsch S. (2000) Re-Os Mobility upon Weathering of Organic-Rich Sediments. *EOS* **81** (48), 1263-1264.

References

- Jaireth S. K., Gupta S. K. and Dave V. K. S. (1982) Mineralogy, geochemistry and geothermometry of sulphide mineralization of the Central Himalayan region of Uttarkashi, U. P. *Him. Geol.* **12**, 280-294.
- Jenny H. (1941) *Factors of soil formation*, McGraw-Hill, New York.
- Jha P. K., Subramanian V. and Sitasawad R. (1988) Chemical and sediment mass transfer in the Yamuna River- A tributary of the Ganges System. *Jour. Hydrol.* **104**, 237-246.
- Karim A. and Veizer J. (2000) Weathering processes in the Indus River Basin: implications from riverine carbon, sulfur, oxygen, and strontium isotopes. *Chem. Geol.* **170**, 153-177.
- Koide M., Hodge V.F., Yang J., Stallard M., Goldberg E., Calhoun J. and Bertine K. (1986) Some comparative marine chemistries of rhenium, gold, silver and molybdenum. *Appl. Geochem.* **1**, 705-714.
- Krishnamurthy, R.V. and Bhattacharya, S.K. (1991). Stable oxygen and hydrogen isotope ratios in shallow ground waters from India and a study of the role of evapotranspiration in the Indian monsoon. In *Isotope Geochemistry: A tribute to Samuel Epstein*, (Editors: Taylor H., O'Neil J. and Kaplan I.) Sp. Pub. Geochemical Society, 1-7.
- Krishnaswami S., Trivedi J. R., Sarin M. M., Ramesh R. and Sharma K.K. (1992) Strontium isotopes and rubidium in the Ganga-Brahmaputra river system: Weathering in the Himalaya, fluxes to the Bay of Bengal and contributions to the evolution of the oceanic $^{87}\text{Sr}/^{86}\text{Sr}$. *Earth Planet. Sci. Lett.* **109**, 243-253.
- Krishnaswami S. and Singh S. K. (1998) Silicate and carbonate weathering in the drainage basins of the Ganga-Ghaghara-Indus headwaters: Contributions to major ion and Sr isotope geochemistry. *Proc. Indian Acad. Sci. (Earth Planet. Sci.)* **107** (4), 283-291.
- Krishnaswami S., Singh S. K. and Dalai T. K. (1999) Silicate weathering in the Himalaya: Role in contributing to major ions and radiogenic Sr to the Bay of Bengal. In: *Ocean Science, Trends and Future Directions* (Editor: B. L. K. Somayajulu), Indian National Science Academy and Akademia International, New Delhi, 23-51.
- Lamb L. (2000) Correlation of conductivity and stable isotope ^{18}O for the assessment of water origin in river system. *Chem. Geol.* **164**, 161-170.
- Levasseur S., Birck J.-L. and Allegre C. (1998) Direct measurement of femtomoles of osmium and the $^{187}\text{Os}/^{186}\text{Os}$ ratio in seawater. *Science* **282**, 272-274.
- Levasseur S., Birck J.-L. and Allegre C. (1999) The osmium riverine flux and the oceanic mass balance of osmium. *Earth Planet. Sci. Lett.* **174**, 227-235.
- Levasseur S., Rachold V., Birck J.-L. and Allegre C. (2000) Osmium behavior in estuaries: the Lena River example. *Earth Planet. Sci. Lett.* **177**, 7-23.
- Louvat P. and Allegre C. (1997). Present denudation rates on the island of Reunion determined by river geochemistry: Basalt weathering and mass budget between chemical and mechanical erosions. *Geochim. Cosmochim. Acta* **61**, 3645-3669.
- Luck J. M. and Allegre C. J. (1983) ^{187}Re - ^{187}Os systematics in meteorites and cosmochemical consequences. *Nature* **302**, 130-132.

References

- Luck J. M. and Allegre C. J. (1991) Osmium isotopes in ophiolites. *Earth Planet. Sci. Lett.* **107**, 406-415.
- Mazumdar A.. (1996) *Petrographic and geochemical characterisation of the Neoproterozoic-Lower Cambrian succession in a part of the Krol belt, Lesser Himalaya*. Ph. D. Dissertation, University of Delhi, pp. 246.
- McCauley S. E. and DePaolo D. J. (1997) The marine $^{87}\text{Sr}/^{86}\text{Sr}$ and $\delta^{18}\text{O}$ records, Himalayan Alkalinity Fluxes and Cenozoic climate models. In: *Tectonic Uplift and Climate change* (Editor: W. F. Ruddiman), Plenum Press, New York, 428-467.
- Milliman J. D. and Meade R. H. (1983) World-wide delivery of river sediment to the oceans. *Jour. Geol.* **21**, 1-21.
- Morford J. L. and Emerson S. (1999) The geochemistry of redox sensitive metals in sediments. *Geochim. Cosmochim. Acta* **63**, 1735-1750.
- Negi, S.S. (1991). *Himalayan Rivers, Lakes and Glaciers*. Indus Publishing Company, New Delhi, pp. 182.
- Negrel P., Allegre C. J., Dupre B. and Lawin E. (1993) Erosion sources determined by inversion of major and trace element ratio in river water: The Congo basin case. *Earth Planet. Sci. Lett.* **120**, 59-76.
- Nesbitt H. W. and Young G. M. (1982) Early Proterozoic climates and plate motions inferred from major element chemistry of lutites. *Nature* **299**, 715-717.
- Nham T. T. (1992) Water analysis using ICP-AES with an ultrasonic nebulizer. *Varian Technical Report, ICP-8*, Dec. 1992, 1-9.
- Nijampurkar V. N., Sarin M. M. and Rao D. K. (1993) Chemical composition of snow and ice from Chhota Shigri glacier, Central Himalaya. *Jour. Hydrol.* **151**, 19-34.
- Njitchoua R., Sighe-Nkamdjou L., Dever L., Marlin C., Sighomnou D. and Nia P. (1999) Variations of the stable isotopic compositions of rainfall events from the Cameron rain forest, Central africa. *Jour. Hydrol.*, **223**, 17-26.
- Palmer M. R. and Edmond J. M. (1989) The strontium isotopic budget of the modern ocean. *Earth Planet. Sci. Lett.* **92**, 11-26.
- Palmer M. R. and Edmond J. M. (1992) Controls over the strontium isotope composition of river water. *Geochim. Cosmochim. Acta* **56**, 2099-2111.
- Pande, K., Sarin, M.M., Trivedi, J.R., Krishnaswami, S. and Sharma, K.K. (1994). The Indus river system (India-Pakistan): Major-ion chemistry, uranium and strontium isotopes. *Chem. Geol.* **116**, 245-259.
- Pande K., Padia J. T., Ramesh R. and Sharma, K. K. (2000) Stable isotope systematics of surface water bodies in the Himalayan and Trans-Himalayan (Kashmir) region. *Proc. Ind. Acad. Sci. (Earth Planet. Sci.)* **109**, 109-115.
- Pandey S. K., Singh A. K. and Hasnain S. I. (2001) Hydrochemical characteristics of meltwater draining from Pindari glacier, Kumaon Himalaya. *Jour. Geol. Soc. India* **57**, 519-527.
- Pant, G.B. and Rupa Kumar, K. (1997). *Climates of South Asia*. John Wiley and Sons, pp. 320.

- Payne B. R. (1983) Interaction of surface water with groundwater. *Guidebook on nuclear techniques in Hydrology, IAEA Technical Report Series* **91**, 319-326.
- Pegram W. J., Krishnaswami S., Ravizza G. E. and Turekian K. K. (1992) Record of seawater $^{187}\text{Os}/^{186}\text{Os}$ variation through the Cenozoic. *Earth Planet. Sci. Lett.* **113**, 569-576.
- Pegram W. J., Esser B. K., Krishnaswami S. and Turekian K. K. (1994) The isotopic composition of the leachable osmium from river sediments. *Earth Planet. Sci. Lett.* **128**, 591-599.
- Peucker-Ehrenbrink B., Ravizza G. E. and Hofmann A. W. (1995) The marine $^{187}\text{Os}/^{186}\text{Os}$ record of the past 80 million years. *Earth Planet. Sci. Lett.* **130**, 155-167.
- Peucker-Ehrenbrink B. and Blum J. (1998) Re-Os isotope systematics and weathering of Precambrian crustal rocks: Implications for the marine osmium isotope record. *Geochim. Cosmochim. Acta* **62**, 3193-3203.
- Peucker-Ehrenbrink B. and Hannigan R. E. (2000) Effects of black shale weathering on the mobility of rhenium and platinum group elements. *Geology* **28**, 475-478.
- Petsch S. T., Berner R. A. and Eglinton T. I. (2000) A field study of the chemical weathering of ancient sedimentary organic matter. *Org. Geochem.* **31**, 475-487.
- Pierson-Wickmann A-C., Reisberg L. and France-Lanord C. (2000) The Os isotopic composition of Himalayan river bedloads and bedrocks: importance of black shales. *Earth Planet. Sci. Lett.* **176**, 203-218.
- Potts P. J., Tindle A. G. and Webb P. C. (1992) *Geochemical reference material compositions*, Whittles Publishing, U.K.
- Prell W. L. and Kutzbach J. E. (1997) The impact of Tibetan-Himalayan elevation on the sensitivity of the monsoon climate system changes in solar radiation. In: *Tectonic Uplift and Climate change* (Editor: W. F. Ruddiman), Plenum Press, New York, 171-201.
- Quade J., Roe L., DeCelles P. G. and Ojha T. P. (1997) The Late Neogene $^{87}\text{Sr}/^{86}\text{Sr}$ record of lowland Himalayan Rivers. *Science* **276**, 1828-1831.
- Ramesh R. and Sarin M. M. (1992) Stable isotope study of the Ganga (Ganges) river system. *Jour. Hydrol.* **139**, 49-62.
- Rao. K.L. (1975). *India's Water Wealth*. Orient Long man Ltd., New Delhi, pp.255.
- Ravizza G. E. and Turekian K. K. (1989) Applications of ^{187}Re - ^{187}Os system to black shale geochronometry. *Geochim. Cosmochim. Acta* **53**, 3257-3262.
- Ravizza G. E. Turekian K. K. and Hay B. J. (1991) The geochemistry of Rhenium and Osmium in recent sediments of the Black Sea. *Geochim. Cosmochim. Acta* **55**, 3741-3752.
- Ravizza G. E. (1993) Variations of $^{187}\text{Os}/^{186}\text{Os}$ ratio of seawater over the past 28 million years as inferred from metalliferous carbonates. *Earth Planet. Sci. Lett.* **118**, 335-348.
- Ravizza G. E. and Esser B. K. (1993) A possible link between the seawater osmium isotope record and weathering of ancient sedimentary organic matter. *Chem. Geol.* **107**, 255-258.
- Ravizza G. E. and Turekian K. K. (1992) The osmium isotopic composition of organic-rich marine sediments. *Earth Planet. Sci. Lett.* **110**, 1-6.
- Raymo M. E. and Ruddiman W. F. (1992) Tectonic forcing of late Cenozoic climate. *Nature* **359**, 117-122.

References

- Raymo M. E., Ruddiman W. F. and Froelich, P. N. (1988) Influence of late Cenozoic mountain building on ocean geochemical cycles, *Geology* **16**, 649-653.
- Richter F. M., Rowley D. B. and Depaolo D. J. (1992) Sr isotope evolution of seawater: The role of tectonics. *Earth Planet. Sci. Lett.* **109**, 11-23.
- Rodhe A. (1998) Snowmelt-dominated systems. In: *Isotope Tracers in Catchment Hydrology*, (Editors: C. Kendall and J.F. McDonnell), Elsevier Science B.V., Amsterdam, pp.839.
- Rozanski K., Araguas-Araguas L. and Gonfiantini R. (1993) Isotopic Patterns in Modern Global Precipitation. In: *Climate Change in Continental Isotopic Records*, Geophysical Monograph, **78**, AGU, 1-36.
- Ruddiman W. F. (1997) *Tectonic Uplift and Climate Change* (ed. W.F. Ruddiman), Plenum Press, New York, pp. 535.
- Ruddiman W. F. and Prell W. L. (1997) Introduction to the Uplift-Climate Connection. In *Tectonic Uplift and Climate Change* (Editor: W.F. Ruddiman), Plenum Press, New York, 3-15.
- Sachan H. K. and Sharma R. (1993) Genesis of Barite mineralisation in the Nagthar Formation, Lesser Himalaya, near Dehradun. *Jour. Him. Geol.*, **4**, 165-170.
- Sarin, M.M. and Krishnaswami, S. (1984). Major ion chemistry of the Ganga-Brahmaputra river systems, India. *Nature* **312**, 538-541.
- Sarin M. M., Krishnaswami S., Dilli K., Somayajulu B. L. K. and Moore W. S. (1989) Major ion chemistry of the Ganga-Brahmaputra river system: Weathering processes and fluxes to the Bay of the Bengal. *Geochim. Cosmochim. Acta* **53**, 997-1009.
- Sarin M. M., Krishnaswami S., Somayajulu B. L. K. and Moore W. S. (1990) Chemistry of uranium, thorium, and radium isotopes in the Ganga-Brahmaputra river system: Weathering processes and fluxes to the Bay of the Bengal. *Geochim. Cosmochim. Acta* **54**, 1387-1396.
- Sarin, M.M., Krishnaswami, S., Trivedi, J.R. and Sharma, K.K. (1992a) Major ion chemistry of the Ganga sources waters: Weathering in the high altitude Himalaya. *Proc. Ind. Acad. Sci. (Earth Planet. Sci.)* **101**, 89-98.
- Sarin M. M., Krishnaswami S., Sharma K. K. and Trivedi J. R. (1992b) Uranium isotopes and radium in the Bhagirathi-Alaknanda river system: Evidence for high uranium mobilization in the Himalaya. *Curr. Sci.* **62**, 801-805.
- Sarin M. M. and Rao D. K. (2001) Atmospheric deposition of chemical constituents on a Central Himalayan Glacier: Inferences from snow chemistry. Proc. "National Workshop on Atmospheric Chemistry", NWAC 99, IITM, Pune, October 1999 (in press).
- Sachan H. K. and Sharma K. K. (1993) Genesis of Barite mineralisation in the Nagthar Formation, Lesser Himalaya, near Dehradun. *Jour. Him. Geol.* **4**, 165-170.
- Schotterer U, Oldfield F, Frohlich K. (1996) In *Global Network for Isotopes in Precipitation*. IAEA/PAGES/WMO/IAHS/AISH, Switzerland.
- Sharma M., Papanastassiou D. A. and Wasserburg G. J. (1997) The concentration and isotopic composition of osmium in the oceans. *Geochim. Cosmochim. Acta* **61**, 3287-3299.
- Sharma M. and Wasserburg G. J. (1997) Osmium in rivers. *Geochim. Cosmochim. Acta* **61**, 5411-5416.

References

- Sharma M., Wasserburg G. J., Hoffmann A. W. and Chakrapani G. J. (1999) Himalayan uplift and osmium isotopes in oceans and rivers. *Geochim. Cosmochim. Acta* **63**, 4005-4012.
- Shiller A. M. and Boyle E. A. (1987) Dissolved vanadium in rivers and estuaries. *Earth Planet. Sci. Lett.* **86**, 214-224.
- Shiller A. M. and Mao L. (2000) Dissolved vanadium in rivers: effects of silicate weathering. *Chem. Geol.* **165**, 13-32.
- Singh S. K., Trivedi J. R., Pande K., Ramesh R. and Krishnaswami S. (1998) Chemical and Sr, O, C isotopic compositions of carbonates from the Lesser Himalaya: Implications to the Sr isotope composition of the source waters of the Ganga, Ghaghara and the Indus Rivers. *Geochim. Cosmochim. Acta* **62**, 743-755.
- Singh S. K. (1999) *Isotopic and Geochemical Studies of the Lesser Himalayan Sedimentaries*. Ph. D. Dissertation, M. S. University, Baroda, pp. 160.
- Singh S. K., Trivedi J. R. and Krishnaswami S. (1999) Re-Os isotope systematics in black shales from the Lesser Himalaya: Their chronology and role in the $^{187}\text{Os}/^{188}\text{Os}$ evolution of seawater. *Geochim. Cosmochim. Acta* **63**, 2381-2392.
- Srikantia S. V. and Bhargava O. N. (1998) *Geology of Himachal Pradesh*. Geological Society of India, Bangalore. pp. 406.
- Subramanian V. and Dalavi R. A. (1978) Some aspects of stream erosion in the Himalaya. *Him. Geol.* **8**, 822-834.
- Taylor A. S., Blum J. D., Lasaga A. C. and MacInnis I. N. (2000a) Kinetics of dissolution and Sr release during phlogopite weathering. *Geochim. Cosmochim. Acta* **64**, 1191-1208.
- Taylor A. S., Blum J. D. and Lasaga A. C. (2000b) The dependence of labradorite dissolution and Sr isotope release rates on solution saturation rate. *Geochim. Cosmochim. Acta* **64**, 2389-2400.
- Trivedi J. R. (1990) *Geochronological studies of Himalayan granitoids*. Ph. D. dissertation, Gujarat University, Ahmedabad.
- Trivedi, J.R., Pande K., Krishnaswami, S. and Sarin, M.M. (1995). Sr isotopes in rivers of India and Pakistan: A reconnaissance study. *Curr. Sci.*, **69**, 171-178.
- Trivedi J. R., Singh S. K. and Krishnaswami S. (1999) ^{187}Re - ^{187}Os in Lesser Himalayan sediments: Measurement techniques and preliminary results. *Proc. Indian Acad. Sci. (Earth Planet. Sci.)* **108**, 179-187.
- Turekian K. K. and Pegram W. J. (1997) Osmium isotope record in a Cenozoic deep-sea core: Its relation to global tectonics and climate. In: *Tectonic Uplift and Climate Change*, (Editor: W.F. Ruddiman), Plenum Press, New York, 383-397.
- Valdiya K. S. (1980) *Geology of the Kumaun Lesser Himalaya*. Wadia Institute of Himalayan Geology, Dehradun, pp. 291.
- Valdiya K. S. (1998) *Dynamic Himalaya*. Sangam Books Limited, London, pp.178.
- Velbel M. A. (1993) Temperature dependence of silicate weathering in nature: How strong of a negative feedback on long term accumulation of atmospheric CO_2 and global greenhouse warming? *Geology* **21**, 1059-1062.

References

- Viers J., Dupre B., Braun J.-J., Deberdt S., Angeletti B., Ngoupayou J. N. and Michard A. (2000). Major and trace element abundances, and strontium isotopes in the Nyong basin rivers (Cameroon): constraints on chemical weathering processes and elements transport mechanisms in humid tropical environments. *Chem Geol.*, **169**, 211-241.
- Volkering J., Walczyk T. and Heumann K.G. (1991) Osmium isotope ratio determinations by negative thermal ionization mass spectrometry. *Int. J. Mass. Spec. Ion Proc.* **105**, 147-159.
- Wedepohl K. H. (1978) *Handbook of Geochemistry*, Vol II-5. Springer-Verlag, Berlin.
- White A. F. and Blum A. E. (1995) Effects of climate on chemical weathering in watersheds. *Geochim. Cosmochim. Acta* **59**, 1729-1747.
- White A. F., Blum A. E., Bullen T. D., Vivit D. V., Schultz M. and Fitzpatrick J. (1999) The effect of temperature on experimental and natural chemical weathering rates of granitoid rocks. *Geochim. Cosmochim. Acta* **63**, 3277-3291.
- Williams G., Marcantonio F. and Turekian K. K. (1997) The behavior of natural and anthropogenic osmium in Long Island Sound, an urban estuary in the eastern U.S. *Earth Planet. Sci. Lett.* **148**, 341-347.
- Williamson J. H. (1968) Least square fitting of a straight line. *Can. J. Phys.* **46**, 1845-1847.
- Yurtsever Y. and Gat J. R. (1981) Atmospheric waters. In: *Stable Isotope Hydrology*, IAEA Tech. Rep. (Editors: J.R. Gat and Gonfiantini), Ser., **210**, 103-142.