FACTORS CONTROLLING THE CHEMISTRY OF GROUND WATERS OF SANDUR SCHIST BELT, KARNATAKA STATE

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Factors controlling the chemical composition of the waters of the earth have been discussed by Gorham[2], Gibbs[1], Ramesam and Barua[3]. Viswanathaiah *et al.*[4] have established the relation between the composition of ground waters and aquifer lithology of Karnataka State. The present investigation reports the results of hydrogeochemical studies of the Sandur schist belt, relevant to water quality.

The Sandur schist belt comprises of essentially two varieties of rock formations, *viz.*, banded ferruginous quartzites and/or iron ores and epidiorites, the former constituting the upper and the latter the lower horizon. Out of the 15 water samples chemically analysed 8 are from the upper horizon (iron formations) and 7 from the lower horizon (epidiorites).

The total dissolved salts of the waters under investigation when plotted in the diagram given by Gibbs (*op. cit.*) with respect to the ratios of Na + K/Na + K + Ca and Cl/HCO_3 + Cl fall in the central portion suggesting the rock dominance (not presented here). This specific area dominance of the points is due to the interaction between the rock chemistry and the chemistry of the percolating precipitated waters into the subsurface.

Table I shows minimum, maximum and range values of the various ions for the waters under investigation. A study of these values indicates that the Na + K, Cl and HCO_3 contents are high in the epidioritic formation whereas SO_4 content is high in the iron formation.

TABLE I

Minimum, maximum and range values of the various ions (in ppm) of Sandur schist belt

	Upper horizon (iron formation)			Lower horizon (epidiorite)		
	Min.	Max.	Range	Min.	Max.	Range
Ca	77	689	612	36	721	685
Na + K	30	210	180	65	880	815
Cl	57	340	283	141	779	638
HCO_3	200	2000	1800	190	3600	3320
SO_4	36	240	204	12	60	48

From the above study the following points are made clear:

1. The chemistry of the ground waters of Sandur schist belt is controlled by the rock dominance or rock type as elucidated by Gibbs (*op. cit.*).
2. The waters of iron formations are rich in SO_4 ion, while the waters of epidiorites are rich in Na+K, Cl and HCO_3 + CO_3 ions.

September 8, 1980.

1. Gibbs, R. J., *Science*, 1970, **170**, 1088.
2. Gorham, E., *Bull. Geol. Soc. Am.*, 1961, **72**, 785.
3. Ramesam, V. and Barua, S. K., *Indian Geohydrology*, 1973, **9**, 10.
4. Viswanathaiah, M. N., Sastri, J. C. V. and Rame Gowda, B., *Indian Mineralogist*, 1978, **19**, 65.

AN IMPROVED SYNTHESIS OF SUBSTITUTED DERIVATIVES OF 2-AMINOADAMANTANE

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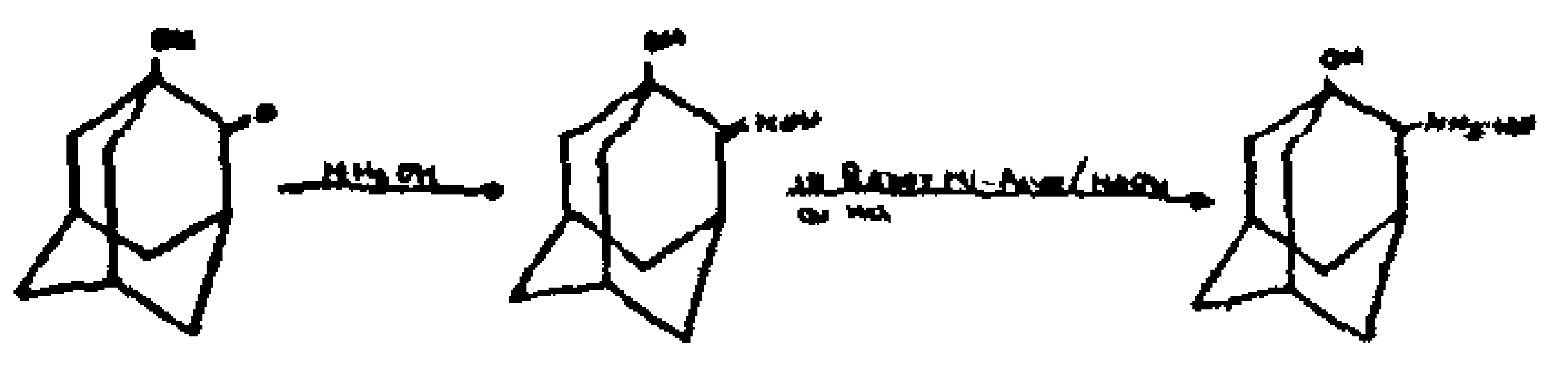
2-AMINOADAMANTANE[1] and other substituted derivatives of 2-aminoadamantane are potential antiviral agents[2]. Many methods for the preparation of substituted derivatives of 2-amino-adamantane are known[3-7] but generally they have one drawback or the other such as unsatisfactory yield, vigorous reaction conditions or difficult work-up procedures. There seems to be no information on the conversion of substituted derivatives of 2-adamantanone to their corresponding amines *via* the reduction of their oximes. In continuation of the earlier work[8] on the preparation of 2-aminoadamantane which is an antiviral drug[9], a convenient method has been developed for the preparation of substituted derivatives of 2-aminoadamantane.



(I) (II) (III)

The results of experiments in which the conditions and relative proportions of reactants were essentially the same are summarised in Table I. The oximinoadamantanes were prepared *in situ* by the reaction of substituted derivatives of 2-adamantanone[5,6,10-12] with hydroxylamine hydrochloride. The oximinoadamantanes formed were then reduced with Raney nickel alloy to the corresponding amines. The extent of reaction as a function of time was noted through