Study on decision support system for water pollution control of ShaYing River

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According to the survey on water quality, hydrology, geography of ShaYing River, water pollution situation is analyzed. Aiming at this serious problem, the present situation of water pollution is analysed, the decision support system of ShaYing River water pollution control is analyzed completely and studied. From the standpoint of development process, functional design, framework and modularization design, using GIS technology and object-oriented programming language Visual Basic, the system with visual interface is exploited with MapObjects of GIS and database. Intelligent management of ShaYing River water pollution control come true, the system achieves functions of inputting information , treating data , searching information, thematic maps, water quality evaluation and water quality prediction, which can help data management, searching and assistant decision for water environment. It will provide a powerful tool and intelligent decision information for ShaYing River's water environment management in the future.

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The geochemical characteristics of the Mashan complex, Guangxi, and its geological implications

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Previous Nd isotope studies about the Mesozoic granitoid intrusions in South China suggested that some bodies formed a southwest-northeast belt with low Nd model ages (T_{DM}) in range of 1.7-1.2 Ga, lower than those of adjacent intrusions. It is also suggested that their magma sources and formation progresses should be related to the crustal extension and asthenosphere upwelling.

The detailed geochemical and geochronological studies about the Mashan complex, Guangxi suggest one possibility that the the magma source of the low T_{DM} intrusions was derived from the partial melting of the Neoproterozoic juvenile mantle. The complex includes diabase porphyrite, diorite porphyrite, syenite porphyry, quartz-syenite porphyry and granite porphyry. Their zircon SHRIMP U-Pb ages are in range of 154-148 Ma, indicating that the complex was formed in a short time. The major and trace element compositions of these rocks suggest that they were derived from one mantle source without Nb, Ta negative anomaly. The $\varepsilon_{Nd}(t)$ of diabase is +2.3, T_{DM}(II) is 0.7 Ga, those of diorite and syenite are +5.9~-+2.6 and 0.7~0.5 Ga, those of quartz-syenite are +0.4 and 0.9 Ga, and those of granitic rocks are -0.3~-2.4 and 1.1~1.0 Ga. The zircon $\delta^{18}O$ of diabase is 6.2‰, that of diorite is 5.7‰, which are close to the mantle value of 5.6‰, however, those of granitic and quartz-syenite are 7.2‰ and 7.5‰, respectively, suggesting that the quzrtz-syenite and granites were slightly contaminated by crustal rocks. The zircon Hf model ages of the grains with ages in 160-140 Ma are mainly in range of 1500-600 Ma calculated by felsic crust, and form a peak value at 1000 Ma.

It is conlcuded that the complex was derived from the partial melting of juvenile lithosphere mantle formed in the Neoproterozoic, triggered by the lithosphere extension and asthenoshphere upwelling. After that, the magma was experienced strongly fractional crystallization. However, the granitic magma was contaminated by crustal materials, which may differentiated from the mantle during the Neoproterozoic and remelted in about 175-160 Ma. It should not be ruled out the contribution of the asthenosphere to the basic rocks.

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