

Studi Pengayaan Arsenik di Formasi Serpong Berdasarkan Analisis Litostratigrafi dan Kemostratigrafi = Enrichment Study of Arsenic in the Serpong Formation Based on Lithostratigraphic and Chemostratigraphic Analysis

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Abstrak

Arsenik (As) dianggap sebagai unsur polutan karena memiliki persebaran yang meluas dalam sistem hidrologi di seluruh dunia. Arsenik dapat bersifat beracun dan menimbulkan berbagai penyakit seperti kanker, ginjal, dan paru-paru di beberapa negara. Pengayaan arsenik dalam batuan sedimen dapat terjadi di lingkungan akuifer dan pengendapan fluvial. Contoh lingkungan tersebut yaitu Formasi Serpong. Tujuan Penelitian ini yaitu mengkaji zona dan mekanisme pengayaan arsenik dalam batuan di Formasi Serpong, Kecamatan Setu, Kota Tangerang Selatan. Penelitian ini menggunakan analisis litostratigrafi dan geokimia dalam menentukan zona dan asosiasi pengayaan As. Hasilnya didapatkan bahwa As terkayakan pada fasies Batulempung C (LC) di zona pelapukan berwarna kuning-kecoklatan dengan asosiasi As-Fe yang diindikasikan sebagai mineral goethite dan zona yang tidak terlapukkan pada fasies Batulempung pumisan dengan asosiasi As-Fe-S yang diindikasikan sebagai mineral As-Fe-Sulfida. Pengayaan As tidak dikontrol oleh efek litogenik yang terlihat dari grafik Ti vs As. As terkayakan secara sekunder oleh proses redoks. Analisis zona redoks menggunakan tangga redoks dan kemostratigrafi dapat menjelaskan bahwa As terkayakan pada zona suboksik (akumulasi Fe-Mn) tepatnya suboksik bawah ketika Fe lebih terpresipitasi tinggi. Selain itu, As juga terkayakan pada zona euxinik ketika Cr, V, S, dan Fe tinggi dalam batuan. Mekanisme pengayaan As di penelitian ini kemungkinan dipengaruhi oleh fluktuasi air tanah masa lalu (paleogroundwater) yang membawa ion Fe, Mn, As terlarut dan menyebabkan terbentuknya siklus redoks Fe-Mn di lapisan suboksik serta reduksi sulfat yang membentuk zona euxinik.

.....Arsenic (As) is considered a pollutant element because it has a widespread distribution in hydrological systems throughout the world. Arsenic can be toxic and cause various diseases such as cancer, kidney, and lung in several countries. Arsenic enrichment in sedimentary rocks can occur in aquifer environments and fluvial sedimentation. An example of such an environment is the Serpong Formation. The purpose of this study was to examine the zones and mechanisms of arsenic enrichment in rocks in the Serpong Formation, Setu District, South Tangerang City. This study used lithostratigraphic and geochemical analysis to determine the zones and associations of As enrichment. The results showed that As was enriched in the C Claystone (LC) facies in the yellow brownish weathering zone with the As-Fe association indicated as goethite minerals and the unweathered zone in the pumisan Claystone facies with the As-Fe-S association indicated as As-Fe-Sulfide minerals. As enrichment is not controlled by lithogenic effects as seen from the Ti vs As graph. As is enriched secondarily by redox processes. Analysis of redox zones using redox ladders and chemostratigraphy can explain that As is enriched in the suboxic zone (accumulation of Fe-Mn) precisely the lower suboxic when Fe is more highly precipitated. In addition, As is also enriched in the euxinic zone when Cr, V, S, and Fe are high in the rocks. The mechanism of As enrichment in this study is likely influenced by past groundwater fluctuations (paleogroundwater) that carry dissolved Fe, Mn, As ions and cause the formation of the Fe-Mn redox cycle in the suboxic layer and sulfate reduction that forms the

euxinic zone.