

Free essay on relative and radiometric techniques

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Introduction

Relative age dating and radiometric dating techniques are useful in establishing geological time scale. They both rely on old evolutionary assumption of Uniformitarianism in that geological features are products of gradual geological forces of the same kind and strength as of today. They differ by principles of determining the ages of geological events, relative dating ranks geological activities in order of their occurrence assuming that lower layers in respective cross section must be older than the upper layers (super positioning) meaning features appearing on top must be the youngest according to (The National Geographic., p. 558). As most of these rocks are originally laid down flat with geological activities causing tilting (horizontal originality), the beds laterally continue to thin unless there is obstacles to its extension. There is also another assumption that any rock structure that includes another must be older than the including rock structure, mostly the igneous rocks when they cause metamorphosis or cross cutting the older preexisting rocks. It's also perceived that fossils succession occurs in definite and determinable sequence and can be used to correlate the age of other features. By contrast radiometric dating compares the plenty of naturally occurring radioactive isotopes and their rates of decaying. Its decays (Alpha, Beta and Electron capture) are principled on half life i. e. the time needed for half of nuclei of the sample to decay exponentially. The ratio of parent to daughter decay can be predicted at every half life regardless of isotope in question and the most radioactive dating techniques are radiocarbon , uranium-lead and potassium-argon dating methods as acknowledged by(U. S. Geological

Survey)

Though radiometric dating gives numerical values as the age of appropriate materials expressed in millions of years, some limiting factors may arise causing both concordant and discordant error. The parent-daughter decay rates may not be constant with leaching effects resulting into inconsistent concentration of parent daughter isotopes and zero date problems when initial conditions and ratio of parent daughter isotope pairing not known. Further more the date obtained may not be the actual age but could be the date when crystallization or metamorphic activities occurred. Relative dating on the other hand does not provide the accurate numerical age values but determines only the sequential history of how events occurred not when. Every date may not be consistent with the prevailing geological time scale but age of respective individual sample and geological time scale should present the present geological activities. Evolution changes are deduced when the geological time scale established helps in outlining the age of fossils

References

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