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Effect of Degradinite on Coal Properties and Its Conversion at Ikeshima Coal Mine

In most of Japan's subbituminous and bituminous coal deposits, the characteristic composition is 95.5% vitrinite group materials (telocollinite and degradinite?), 3% exinite group materials (sporinite, cutinite, and resinite), and a small friction of inertinite group materials (sclerotinite and fusinite). Analysis of the coal at the Ikeshima mine has shown that the quality of the coal is directly related to the vitrinite maceral composition. Thus it is concluded that there can be considerable variation in the quality of coal, depending upon the degradinite content.

1. Degradinite shows higher H/C and n-alkane compared with telocollinite so higher degradinite content results in higher calorific value and volatile content.
2. Vitrinite reflectivity is inversely proportional to degradinite content. This is based on the fact that chemical and physical properties of telocollinite is likely to be controlled by differences in paleogeography and diagenesis.
3. Gieselar maximum fluidity increases exponentially with the increase in degradinite content.
4. Hydrogenation reactions were performed at a reaction temperature of 380°C, hydrogen initial pressure of 30 kg/cm^2 and reaction time of 30 minutes, using a 500 ml batch type autoclave.

The conversion rate increases in proportion to the increase in degradinite content.

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Uranium on Oceanic Side of Circum-Pacific Mobile Belt

Asymmetrical continental margin orogenic belts have superimposed mineralization belts also zoned asymmetrically toward low temperature in the foreland, suggesting orogenic redistribution of crustal metals. The quantity of uranium concentrated into deposits is maximum in a final forelandward zone. High-temperature Th-U concentrations are less prominent in rearward tectonic zones.

Unfavorability of tectonic zones oceanward of the batholith zone, for low-temperature uranium, predicted in 1970, is reviewed as a test of the metallo-tectonic concept, after 12 years of intensive exploration during the price peak.

Of 19 Pacific-margin countries containing island-arc, back-arc-flysch-basin, pluton-in-flysch, or batholith tectonic zones, three aggregate six uranium deposits (four of low temperature), nine prospects, and perhaps ten occurrences. Two more countries have one prospect each. One vein is in island-arc andesite. Two disseminations in basin flysch may represent submarine exhalations. Several high temperature veins are associated with alkaline plutons in flysch, and several high temperature replacement disseminations with "porphyry" copper/molybdenum deposits are known. Many uneconomic high temperature replacement disseminations in alkaline granite are known in the batholith zone. One economic dissemination is in a granite pluton contact zone and two supergene impregnations are in regolith over granite batholith. Several impregnations occur in basin sandstones derived from and overlying granite.

Strongest uranium mineralization in oceanward tectonic zones was associated with cratonization of oceanic rocks.

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Early Environmental Planning for Offshore Oil and Gas Exploration and Production

(No abstract)

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Principal Features of Epithermal Lode Gold Deposits of Circum-Pacific

Production from epithermal primary lode gold deposits along the Circum-Pacific rim exceeds one million ounces annually, from around 20 countries. Distribution of this important deposit type coincides with, and is genetically related to, convergent plate boundaries and the chain of associated volcanic-plutonic activity framing the ocean basin. Deposits are emplaced as clusters along two subparallel belts: the ocean margin transition zone and the zone within the continental framework boundary. Ocean margin deposits are associated with island arc-type intemediate to mafic igneous activity, active geothermal phenomena, and subduction-related regional fracture systems. Deposits inside the continental margin are associated with intermediate to felsic volcanic-plutonic belts and exhibit block faulting or volcano-tectonic fracture control. They feature strong Pb-Zn-Ag and local S-W metal associations. Within both belts, a continuum exists between near surface hot spring deposits, local disseminated replacement (Carlin-type) deposits, and deeper bonanza systems. Hot spring and replacement deposits feature relatively high Au:Ag ratios, contain micron-sized gold particles, are enriched in Hg-As-Sb-Ba, and are hosted by hydrofracted quartz-pyrite stockworks or fine-grained carbonaceous limestones. Bonanza deposits are characterized by polymetallic veins and stockworks. Economic concentrations require initial high gold solubility, unrestricted recharge of meteoric water into a region of steady high heat flow, fracture-controlled fluid focusing, and either host-rock reactivity or episodic self-sealing, with explosive pressure release in the zone of deposition. Boiling, temperature decrease, solution oxidation and local ground-water mixing are the primary processes of ore deposition. Modern-day analogs of such ore forming systems exist in New Zealand, Japan, western USA, Indonesia, and the Philippines, among others.

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Main Features of Kuril-Kamchatka Deep-Sea Trench Tectonics and Geologic Development

The upper crust structure of the Kuril-Kamchatka deep-sea trench and continental slope is a system of horst-anticlinorial uplifts of the acoustic basement and separating them partially are compensated graben-synclinorial troughs stretching in the northeastern direction according to the trench general trend.

From dredging data the acoustic basement rock associations of the horst-anticlinorial uplifts of the trench continental slope are pre-Neogene (Late Cretaceous and older) complexes of the deformed geosynclinal volcanogenic and sedimentary deposits broken by gabbroids, granodiorites, and granitoids. Graben-synclinal troughs are filled with sedimentary deposits mainly of the Neogene-Quaternary ages, the thickness of which in some basins exceeds 1.8 mi (3 km).

The oceanic slope of the trench is composed of the sedimen-

tary layer with thickness of about 300 to 990 ft (100 to 300 m), lying on the second layer of the oceanic crust. According to the dredging, the acoustic basement roof on the marginal oceanic swell (Hokkaido Rise) is mainly composed of metamorphosed basalts and it seems to include the sedimentary rock intercalation. From the whole rock K-Ar data, the period of intensive basaltic volcanism on the Hokkaido Rise is from Cretaceous to Paleogene.

Crustal faults along the Kuril-Kamchatka and Aleutian trenches can be characterized as "normal faults," especially for the oceanic side, which points out their development in crustal tension conditions.

The faults transversal to the trenches are mainly established from magnetic data. The anomalous magnetic field is subdivided generally in two regions in which the trend of anomalies varies from the subparallel (in the southern part of trench) to the subtransversal to the trench (in the northern part). A vast region next to the oceanic plate adjacent to the crustal and northeast parts of the Kuril-Kamchatka trench is characterized by the absence of linear magnetic anomalies which can be associated with the structure and movement of the subducted plate.

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Cenozoic Sedimentary Basins of Okhotsk Sea

The northern and central parts of the Okhotsk Sea is the epi-Mesozoic platform. The hetero-aged acoustic basement is represented by the deformed geosynclinal rocks from Cretaceous to Paleozoic and, probably, Precambrian. The slightly deformed sedimentary cover leveled the uneven surface of the acoustic basement, and this upper Paleogene-Neogene-cover filled the system of the structural basins. The general northwest to southeast and east-to-west trending taphrogenic horsts and grabens of the acoustic basement were formed due to extending and subsiding of the earth's crust during late Paleogene–Neogene time.

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Preliminary Results of Leg 2 *Lee* Cruise in Central Basin of Vanuatu to Assess Hydrocarbon Potential and Geologic Evolution of New Hebrides Arc Basins, Southwest Pacific

We report on a CCOP/SOPAC coordinated cruise, funded by Australia, New Zealand, and the United States (ANZUS), that surveyed the Central basin of Vanuatu (former New Hebrides) in May 1982, to examine the hydrocarbon potential of the region. Our work was concentrated primarily in the Big Bay-Jorden River graben area and along the eastern flanks of Espiratu Santo and Malekula Islands, where we examined structural and stratigraphic characteristics in detail. The collection of continuous multichannel seismic, single-channel intermediate penetration and high-resolution seismic, magnetic, and gravimetric profiles provided significant new data for the evaluation of oil and gas traps and geologic hazards.

The region is an active volcanic arc that overlies an east-dipping seismic (Benioff) zone. Geologic history of the region is complex because subduction directions shifted from east to west in post middle Miocene time. Subsequent tectonism resulted in block faulting of upper Tertiary sedimentary and volcanic rocks, forming islands with narrow shelves and intervening deep-water basins.

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Small Scale Hydropower in Papua New Guinea

Papua New Guinea has an area of 178,364 mi^2 (461,961 km^2) and is large compared to the other island nations of the western Pacific. It lies between 2 and 10° south of the equator, has one of the highest average rainfalls anywhere in the world, and has a mountainous geography. These factors give the country a vast potential for hydropower. To date, with one or two notable exceptions, this potential has not received significant attention. Public Utility schemes form the mainstay of the electricity development plan, but smaller scale applications are proving difficult to initiate in significant numbers. During the last 20 years, many small hydropower schemes fell into disuse, mainly through lack of skilled maintenance. Some were even replaced by diesel generation despite the disparity in total cost.

Recently there have been moves in several areas of the country to implement modest Rural Electrification Programmes. Papua New Guinea has only a few transmission lines, linking a handful of centers. A national electricity grid system has yet to evolve. Small towns and rural centers are supplied independently, usually by diesel generators.

Rural Electrification research and development work has been proceeding at the University of Technology in Lae for nearly 10 years. Over the last few years, development has concentrated on small (1-50 kW), village scale, self-help hydrosystems which are inexpensive, easy to operate and, above all, reliable. This has led to developments in these areas: (1) electronic load controllers and protection devices; (2) turbine design suitable for local manufacture; (3) inexpensive transmission lines; (4) induction generators; and (5) reticulation and wiring for bush material houses.

At the same time, the university has become involved in site surveys and project evaluation on behalf of local governments. It also assists with planning and submissions for funding. While the details of these developments will be of interest in other Pacific Islands, perhaps the most important aspect is the coordination between local governments and users to implement and maintain these projects.

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Reflection Profiling Studies of 500-Meter Shelf South of Oahu: Reef Development on a Mid-Oceanic Island

(No abstract)

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Developing Canada's Energy Resources in the 1980s

(No abstract)