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Complex study of the gas hydrates in the Asian seas

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Margins of western Pacific Ocean present numerous gas hydrates sites distributed as gas hydrates provinces (referred to the marginal seas) which can be combined to the East Asia gas hydrate belt. Gas (mainly methane) hydrates accumulation induced by various active geological features determined by geo dynamic and tectonic type and seismic states of Pacific and adjoining lithosphere plate's border. Near the seafloor gas hydrates are strongly influenced by the hydrology parameters. Bering Sea, Okhotsk Sea, Japan Sea, East-China Sea, South-China and Philippine Seas offshore exposed numerous methane hydrates distribution in sediments. Hydro acoustic, seismic, coring and geochemistry were a prime methods applied to gas hydrate searching and exploration. Methane hydrates was explored since 86th (Sea of Okhotsk). The distribution of gas hydrates are related genetically with hydrocarbon accumulations within the thick Cenozoic sediment basins (up to 15 km thickness) and controlled particularly by active faulting belongs to subduction, transform and convergent plate's border. Fracture type gas hydrate sediments filling is the most promising (massive gas hydrates). Accretionary prisms along the subduction zones considered lithology gas hydrate filling (dispersed gas hydrates). Modern high seismic activity cause fault activities that break through the sea floor and create a favorable gas-permeable state along shear zones. Submarine gas seepage usually accompanied by contrast seismic and acoustic anomalies in the sediments and water column (up to 700 gas flares prior to 2015 indicates gas hydrate fracture type accumulation in Okhotsk and Japan Seas). Gas hydrates recovered by coring and drilling (Japan, Korea, China). Pleistocene-Holocene is most studied gas hydrate bearing sediments (upper hydrate distribution, coring sampled 0-10 meters bsf). Second floor of gas hydrate was proved by drilling e.g. in the northern South-China Sea for 170-230 m bsf and south of Japan Sea (KIGAM). Third floor is up to 300 mbsf examination in the Nankai Trough. Methane origin discussed as mixture of abiogenic, metamorphic, thermo genic and microbial gases. Methane resources trapped in the East Asia marginal seas gas hydrates can be estimated based on latest investigations at least for 5×10^{14} cubic meters, but this estimation is too rough and needs urgent clarification jointly by gas hydrate hosted countries. Very new gas hydrates were found by community in the north of Japan Sea (Tatar Strait) and in the south-west of the Sea of Okhotsk in 2015-2016 and in the east of the Japan Sea and north of South-China Sea. But too many promising areas studied insufficiently or not covered by any scopes with direct methods (north of Japan sea, East-China seas could be explored by coring, most area of the South-China and Bering Sea). Very special case study expected to be in the Eastern Arctic.

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