



New data from the shallow gas fields in the Ría de Arousa (NW Spain)

R. Diez, S. García-Gil, F. Vilas

Dpto. Geociencias Marinas, Facultad Ciencias del Mar, Universidad de Vigo, Vigo, Spain
(sgil@uvigo.es / Fax: +34-986812556)

The Ría de Arousa with 230 km² surface is the biggest of the Rías Baixas (NW Spain). Several surveys (1991, 2001 and 1996) were carried out in the Ría de Arousa in order to study the shallow gas accumulations and gas escape related features. Also, grab samples and gravity corers were collected in the ría. Grain size distribution, organic matter content and percentage of carbonate was analyzed for each sample.

In May 2004, a new seismic survey was carried out. High-resolution seismic data of a very high quality were acquired following a grid of NE-SW and NW-SE track lines covering the entire submarine area. The data collected in this survey substantially improved the previous information available (quality and new surveyed sectors).

The interpretation of seismic data revealed a new gas field located in the central sector of the ría south to Arousa Island. This new gas field occupies an extension of 1.29 km² ranging from 0.4 to 1.29 ms (TWT) beneath present seabed. This implies that 25% of the ría extension is occupied by shallow gas accumulations.

Furthermore, 59 crater-like features up to 20-30 m wide and 1-2 m deep were found. Five of these pockmarks were already identified in the survey from 1991 and showed similar size and appearance. The underlying gas appears migrating upwards reaching the bottom of these depressions and keeping active the gas escape through the pockmark.

Comparing both, the extension and depth of gassy areas from the seismic surveys (1991, 2001 and 2004), it is observed that only the external fields show slight variations. Although different parameters (P, T, solubility of gas, etc.) have been reported as controlling factors for gas occurrence, here the sedimentary facies are shown as other

factor to be considered.

The samples collected from the facies overlying gas accumulations in the whole ria show a mean value of 93 % mud content. At the inner fields, where gas accumulates almost at the present seabed (0.4-8.9 ms TWT), these facies are acting as seal and the OM reach up to 13%.

In the external fields, gas fronts appear deeper (3-8 ms TWT), so vertical changes of sedimentary facies can occur in the sediments. Here the presence of continuous gas fronts showing different depths are considered as due to lateral changes of the sedimentary facies in the overlying seal. Lateral migration of gas is identified in the seismic data by the presence of enhanced reflectors adjacent to acoustic turbidity areas that mainly follows the surface that separates the two upper Holocene seismic units.