Diamondoids Occurrence and Distribution in Selected Oils from Brazilian Marginal Basins

J. B. Tamanqueira1*, L. S. Jesuino1, D.A. Azevedo2, F.T.T. Gonçalves3,4, L. Landau1

1 LAMCE/COPPE/Universidade Federal do Rio de Janeiro, I-2000, sala I-214, P.O. Box. 68552,21949-900, Brazil; E-mail: jboechat@lamce.ufrj.br;

2 Departamento de Química Orgânica, Instituto de Química, Universidade Federal do Rio de Janeiro, Brazil;

3 GIMAB/LAB2M/COPPE/UFRJ, Centro de Tecnologia, Bloco I-2000 (anexo), Rio de Janeiro, Brazil, 21949-900;

4 PGT-Petroleum Geoscience Technology Ltd., Rua 2 s/n, Incubadora de Empresas da Coppe, Cx. Postal 68.568, Rio de Janeiro, Brasil, 21945-970.

Diamondoids comprise a class of saturated polycyclic hydrocarbon compounds with a diamond-like structure that occur naturally in petroleum. Highly stable, diamondoids are more resistant to thermal and biological destruction than other hydrocarbons. Diamondoids-derived parameters have been used in the assessment of the degree of thermal evolution and extent of secondary cracking of light oils and condensates and in the recognition of mixtures of oils from distinct migration pulses (e.g. Dahl et al., 1999).

In this study, diamondoids occurrence and distribution was investigated for a set of representative oil samples from sedimentary basins of the eastern Brazilian margin. Selected samples were submitted to liquid chromatography using a silica gel column. Saturated and aromatic hydrocarbons and NSO compounds fractions were eluted using n-hexane, n-hexane:dichloromethane and dichloromethane:methanol, respectively. Saturates fractions were analyzed using a Hewlett-Packard 5890 series II gas chromatograph coupled to a Hewlett-Packard 5972 mass selective detector. Diamondoid compounds were identified through correlation with published mass spectra and mass chromatograms (Chen et al., 1996).

Analytical results allowed the characterization of diamondoids hydrocarbons distributions in the selected samples. Diamondoids and biomarker ratios led to a more refined maturity assessment of the oils. The combination of diamondoids data with source-dependent biomarker parameters also allowed the characterization of different oil families and their possible source rocks. The results of this study have corroborated the importance of applying biomarker and diamondoid analysis for the understanding of petroleum systems dynamics in sedimentary basins.

**Keywords:** hydrocarbons; diamondoids; biomarkers; thermal maturity; Brazilian basins

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**References**