ABSTRACT
STUDY IN TRAINING ISOTOPIC IRATI, PARANA BASIN

Conforti, Renata Silva

University of the State of Rio de Janeiro-UERJ, e-mail: renatauerj2012@gmail.com

INTRODUCTION

The Paraná Basin is an intracratonic basin filled with sedimentary and volcanic rocks. Located in the southeastern portion of the South American continent, occupying an area of 1,600,000 km ². Its evolution is directly linked to the Paleozoic orogenies resulting establishment of Gondwana and subsequently the opening of the South Atlantic, where the basin was located in the western part of WestGondwana.

Geochemical and paleontological criteria indicate a marine depositional environment restricted ("Gulf Irati"), with development of haloclinos, or by density stratification of the body, allowing the preservation of abundant amorphous organic matter of algal origin (Milani, 1997). The Irati Formation corresponds to the basal portion of the Passa Dois Group, it is subdivided into two members: Service and Taquaral.

The Taquaral Member is designated by a thick layer of low clayey siltstones, dark gray color, located at the base. The Member Assistance consists of a dark gray section shales, siltstones and black shales pirobetuminosos associated with limestones, sometimes dolomitic, situated on the top (Fulfaro et al., 1980).

Several studies have already been drawn in the Paraná Basin, with its diversity of interests, often exploratory natural resource. What one hand contributes to the formulation of recent work, reaffirming and updating information previously raised by other techniques. This fact demonstrates its natural wealth is in finding areas also required in DNPM (National Department of Mineral Production) for substances of sand, clay and gold (not exploitable in the perimeter of the study). Each other in the research phase in extraction, thereby reaffirming the economic value of the area. Without forgetting to mention the use of limestone in the agricultural area, which can be demonstrated along the ranges of isotopes present.

Keywords: isotopes; diagenesis; carbonate.

MATERIALS AND METHODS

At first, it is necessary to establish that the oxygen isotopic data on whole rock, are little used in stratigraphic correlations due to the possibility of diagenetic changes. However, even acknowledging these limitations, they often exhibit the same trends of the isotopic data based on fossils that were not affected by diagenesis. Thus, the use of isotopic data on whole rock, as in the present study is considered valid as long as relative values (Rodrigues, 2005 apud Magno Freitas, 2004).

The isotopic data are expressed as the standard sample (PVBD), expressed in parts per thousand according to the international standard Vienna Pee Dee Belmnite, based on the isotopic ratio ofoxygen and carbon belemenites the Cretaceous Pee Dee Formation in South Carolina (Weissert et al., 2007).

Carbonates in the values of δ13C and δ18O. While the samples are related to silicates, water, sulfates and others are common SMOW standard.

Isotopic analyzes were performed using the automatic preparation unit Kiel III Carbonate Device coupled to a mass spectrometer MAT 252 THERMOFINN Igan. The results of stable carbon isotopes (δ 13 C) and oxygen (δ 18).

The use of isotopic data on whole rock was used, considering the relative values as suggested revision bibliográfica.Foram analyzed samples from a well placed within the Paraná Basin, on the outskirts of Sao Paulo region.

Well espessuara presents approximately 50 m depth (190-240m), dated as Neo-Perminao between 253.125 to 256.25 Ma Ma Inside the Irati Formation, studied at the point of bituminous follelho view to siltstone, and calcálrio fertilizer.

RESULTS AND DISCUSSION

The use of isotopic data on whole rock was used, considering the relative values as suggested by the literaturereview. Figure 1

The combined study of carbon isotopes of carbon and oxygen isotopes in carbonate rocks is used to distinguish the processes involved in their formation and also in understanding and determining the diagenetic environments.

Once knowing the lithology of the formation, characterized mostly as shale, purobetuminoso shale, siltstone, marl and carbonate levels in calcite and dolomite carbonate and marl intervals according to study stable isotopes can be studied.

The content of calcite in the sample is identified with alternating oxygen isotope values regarding the presence of carbonate in the sample. Where the values of carbonate decreased almost absolutely cause the increase of oxygen isotopes, if you carbonate. The same happens in reverse. Which the increase in carbonate content leads to answer a many feature nutrient-rich waters.

Among the range 215 to 240 m characterized the Taquaral Member and 195 to 215 mo Member Assistance Irati Formation.

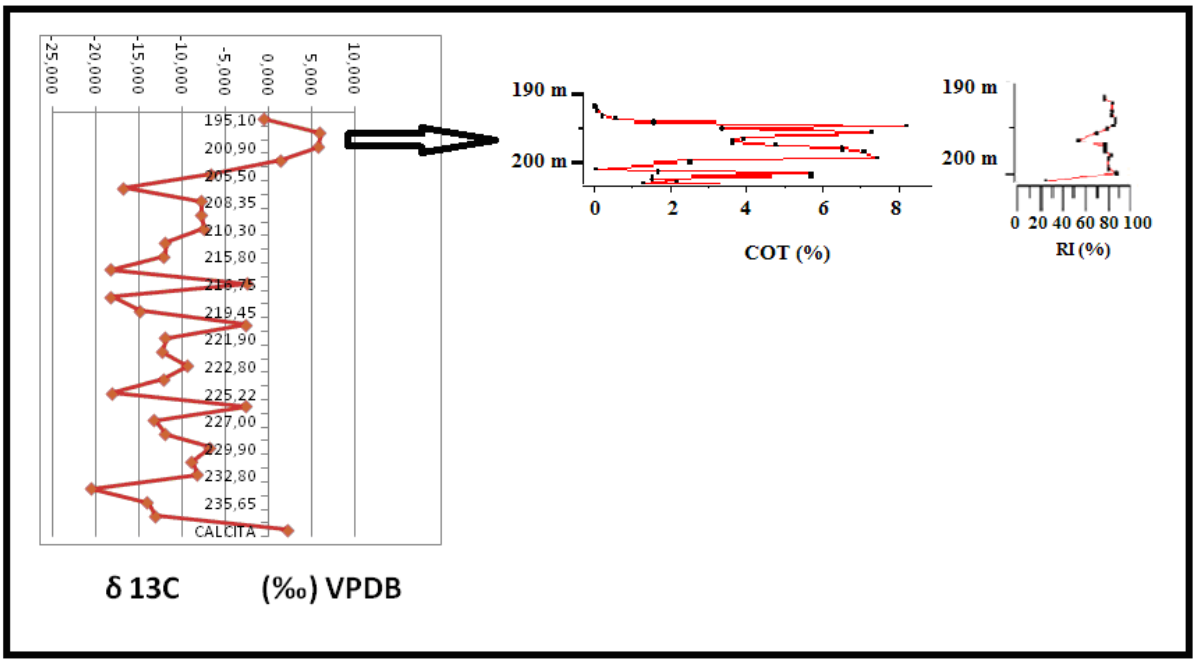

Figure 1 *- δ C13 values of calcite in intervals greater COT*

Negative values in the δ O18 isotopes. mark evidence dolomitization near the surface. What can be considered that the presence of dolomite is characterized by burial and provides isotopic signatures much more negative δ O18 ranging between (-5 to -15%) according Wrihgt & Tucker (1990).

What can be observed that the range of 205.5 m and 235.65 δ values isotopes O18 keeps negative and in the range between 210 and 220 m there is an increase in positive values. On the other hand, negative values alternate between -10 and -20. Figure 2

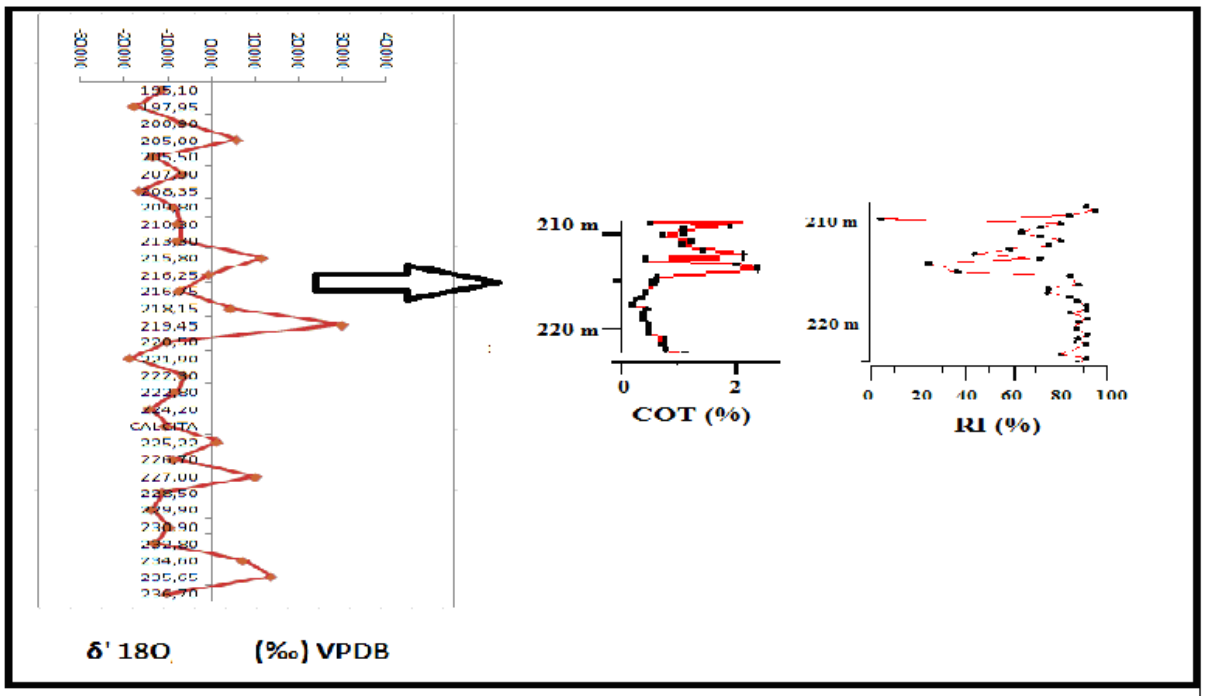

Figure 2 *- Range more positive value of δ O18 isotopes relative to TOC.*

According Garlick (1969 Hoefs in 1987), dolomite, when isotopic equilibrium with calcite, shows higher values of δ O18 reflecting cristallochemical characteristics inherent to the two carbonates. The enrichment in δ O18 in dolomite compared to calcite, is, according to Deines (1970), a common phenomenon in carbonatites. When in isotopic equilibrium, these two minerals have a difference in δ C13 approximately l% to 2% o.

Once described by Diaz, 2009 where positive values of δ and δ O18 C13sugerem early cementation. Evaluating this way, the positive values of these isotypes in the range of study are not linked to carbonates and marl intervals in lithologic profile. Where the insoluble residue has value between 80 and 90 probably siltstone or shale marking according to the known lithology of the area.

CONCLUSION

Relying on the correlation between the increase of oxygen associated with the presence of carbonate. As diagenesis delineated by the presence of dolomite and calcite carbonatite intervals giving the marl. Once called carbonatites for the short range is impractical, we consider interleaved levels in calcite and dolomite rock causing negative values of stable isotopes.

The carbonate cementation in silissiclásticos levels and the increase in the values of δ O18 inferring decrease in sea level, responding to lithological change to siltstone / carbonate and conversely.

Positive values of δ O18 mark a possible decrease of the water body in accordance with the system in restricted environments evaposração and isotope content of water in the marine environment.

REFERENCES

1. Alferes, C. L. F.; Rodrigues, René; Pereira, E. (in press). Organic Geochemistry Applied to the Irati Formation, In Area of São Mateus do Sul (PR), Brazil. Geochimica Brasiliensis, 2012.
2. Arthur, PC Soares, PC Paleoestruturas and Oil in the Paraná Basin, Brazil 2002. Brazilian Journal of Geosciences. V.32, No. 04. (December, 2002) p.433-448.
3. Brazil. 1986. Company Mineral Resources Research. Project Eastern Edge of the Paraná Basin: Integrating Geological and Economic Evaluation. Sao Paulo: CPRM, 1986.
4. Espitalié, J., Laporte, Jl, Madec, M., Marquis, F., Leplat, P., Paulet, J., 1977. Méthode rapide of caractérization of mères roches, the potentiel et de leur leur pétrolier dergré d'évolution . Revue de L'Institut Francais du Pétrole, 32 (1): 23-43.
5. Figueiredo, A.M.F. Of; MILANI, EJ 2000. Petroleum Systems of South American Basins. In: Gordani, ug;
6. Milani, E. J.; Thomaz Filho, A.; Fields, The Tectonic Evolution of South America, Rio de Janeiro: 31st International Geological Congress, 2000, p.689-718..
7. Rohn, R; Rosler, O. Relations between the Permian of Gondwana flora and floras of the northern provinces. IN: Brazilian Congress of Paleontology, 10 Anais.1987.. Rio de Janeiro: Brazilian Society of Paleontology, p.885-899.