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Revised genetic diagrams for natural gases based on a global dataset of >20,000

samples

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Abstract

The origin of natural gases, in particular those containing methane (CH₄ or C₁), ethane (C₂H₆ or C₂), propane (C₃H₈ or C₃) and carbon dioxide (CO₂), is commonly interpreted using binary genetic diagrams of δ^{13} C-C₁ versus C₁/(C₂+C₃), δ^{13} C-C₁ versus δ^{2} H-C₁ and δ^{13} C-C₁ versus δ^{13} C-CO₂. These diagrams are empirical, but their currently used genetic fields were proposed around 30-40 years ago based on geographically and geologically limited datasets of tens to few hundreds gas samples. As a result, many recently collected gas samples plot outside of accepted genetic fields making these genetic diagrams partly inadequate for the purpose of gas interpretation. Here, we

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