Biogeosciences Discuss.,
https://doi.org/10.5194/bg-2019-419-AC1, 2020

Biogeosciences Discussions

Interactive comment on "Comment on "Ideas and perspectives: is shale gas a major driver of recent increase in global atmospheric methane?" by Robert W. Howarth (2019)" *by* Michael D. Lewan

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Received and published: 20 August 2020

The comment was uploaded in the form of a supplement:
https://bg.copernicus.org/preprints/bg-2019-419/bg-2019-419-AC1-supplement.pdf

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2019-419, 2020.

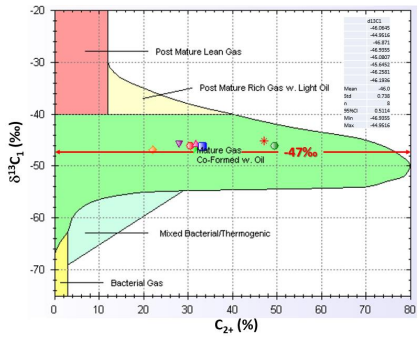

Figure 1. Plot presented by Schoell and LeFever (2011) showing composition and $\delta^{13}CH_4$ values for Associated gases produced with oil from the Bakken Shale.

Fig. 1.

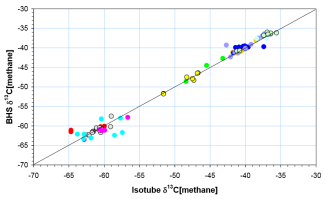

Figure 2. Comparison of $\delta^{13}CH_4$ obtained from mud gas samples (isotubes) versus bottom hole gas samples (95 samples, from Dawson and Murray, 2011).

Fig. 2.

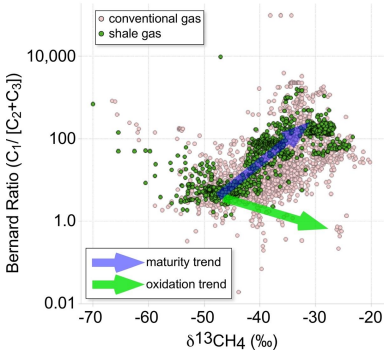

Figure 3. Bernard plot of gas wetness versus $\delta^{13}CH_4$ of CG and SG from Milkov et al. (2020) showing maturation trend and methane oxidation trend.

Fig. 3.

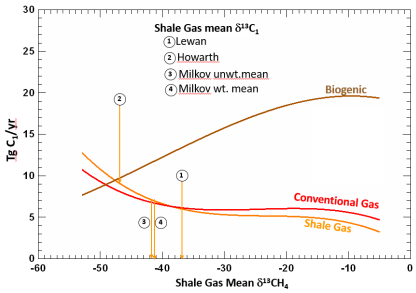

Figure 4. Plot of the sources of methane emissions from Biogenic, conventional and shale gas sources as a result of mean $\delta^{13}CH_4$ values used for shale gas according to the rationale and mathematical constructs of Howarth (2019).

Fig. 4.