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Carbon-14 in Colorado CO_2 Gas Wells

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Abstract

Radiocarbon (carbon-14), with a half-life of 5730 years, is found throughout the geological record. The confirmation of this fact in the cases investigated in this paper further strengthens the young-earth creationist paradigm. This research broadens the information base by sampling two major CO_2 gas fields in Colorado for their carbon-14 content. The results indicate that carbon dioxide data are consistent with that obtained previously from other CO_2 and natural gas fields.

Introduction

This paper is the fourth in a series that shows that significant detectable amounts of radiocarbon (^{14}C) will always be found in the carbon dioxide gas fields of the western United States. Of those fields, well gas samples have been previously obtained from CO_2 wells in the Bravo Dome field in northeastern New Mexico, the Sheep Mountain field in south central Colorado, the McElmo Dome field in southwestern Colorado, and the St. Johns field in eastern Arizona (Doughty, 2005). The well gas samples were analyzed at the University of Arizona AMS facility for their stable and radioactive isotopic content: carbon-13 and oxygen-18 and carbon-14. This article presents a new data set for three CO_2 gas wells in the McCallum Dome field near Walden, Colorado. An expanded data set from four wells was obtained from the McElmo field. The results are compared with other carbon-14 data previously obtained. The stable isotopes, carbon-13, noted as $\delta^{13}C$, and oxygen-18, noted as $\delta^{18}O$, are also compared with previous data. The carbon-14 data are also examined relative to previously obtained data (Gilfillan et al., 2008) for certain noble gas isotopes: neon, argon, krypton, and xenon. The reason for presenting the comparison is to point out the error in the evolutionary model that attempts to ascribe an "age of millions of years" to these inert, nonradioactive gases (Lippmann-Pipke et al., 2011). The prevailing evolutionary model assumes the earth's atmosphere was formed by outgassing from the mantle (Porcelli et al. 2002). Thus the atmospheric values should be less than those obtained from the interior. This work shows that even if the noble gas atmospheric values are greater than those obtained from the interior, the gas is "young" because of the presence of ^{14}C in the CO_2 well gas.

The McCallum Field

CO_2 was discovered in the McCallum field in 1926. Unlike other CO_2 fields there are also oil wells in the area. Those wells are about 1600 feet deep. The production depths for the CO_2 wells are on the order of 5,000 feet. Based on the noble gas data reported by Gilfillan et al. (2008), well numbers 5, 13, and 8–3 were selected and sampled on August 27, 2013. Two gas samples were obtained at each well site. The sampling equipment is the same that has been used previously, with the exception that the sample

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Well #	Depth feet	^{14}C PMC	$^{20}Ne/^{22}Ne$	$^{21}Ne/^{22}Ne$	$^{40}Ar/^{36}Ar$	$^{84}Kr/^{36}Ar$	$\delta^{13}C$ pdb	$\delta^{18}O$ smow
8–3	5308	0.30 **2.97**	10.10	0.0627	7049	0.0349	-5.32	23.61
5	4988	0.25 0.20	10.17	0.0615	3894	0.0370	-6.30	27.32
13	5406	0.20 **0.94**	10.02	0.0464	3451	0.0368	-6.45	28.08
Air		*100*	*9.80*	*0.029*	*295.5*	*0.0207*	*-7.05*	*23.5*

Table I. McCallum Well Gas Data

cylinders are now joined to the main apparatus by quick disconnects rather than by threaded connections. That made the sampling process simpler and also provided a better means to further lessen the possibility of air contamination when changing out the sample cylinders. CO_2 gas well pressures were on the order of 500 psi. Once attached to the wellhead as shown in Figure 1, the sampling system was opened in the following sequence. The flow went through the surge cylinder first; then the valve to the other half of the system was opened (not fully), and the exhaust valve was opened. The sample system pressure was on the order of 20 psi. After the flow was well established (~ 5 minutes), the sample cylinders were opened, and flow proceeded through the two 10cc sample cylinders and a central port vent. After several minutes, the exhaust valves of the sample cylinders were closed, while the central port was left open. It was then closed and the system exhaust valves closed. The sample cylinders were then removed from the system via the quick disconnects and another set installed for use at the next well site. The expected $^{14}C/C$ values were in the range of 0.2 and 0.4 pmc based on the values obtained from CO_2 gas wells.

Gilfillan et al. (2008) measured the neon, argon, and krypton values of the McCallum wells. These values are shown in Table I. The values are *greater than air*, which goes against the evolutionary model of the atmosphere, as noted above. However, this is in keeping with observed behavior in two other CO_2 gas fields, the Bravo Dome in New Mexico and the Sheep Mountain field in south-central Colorado.

All the noble gas values are greater than air, an enigma for evolutionists. For comparison, the $\delta^{13}C$ for CO_2 in air is -6.7 to -7.4 pdb (Keeling, 1961). The $\delta^{13}C$ for CO_2 in the Bravo Dome, Sheep Mountain, and McElmo gas wells previously sampled (Doughty, 2005) varied from -3.36 to -4.59 pdb. While the McCallum $\delta^{13}C$ values are greater than other CO_2 gas wells, they are still less than the standard air value. Similarly, the $\delta^{18}O$ values are on the same order as the four fields sampled previously (Doughty, 2005): Bravo Dome = 19; Sheep Mtn. = 28.9; McElmo = 25.4, and St. Johns = 24.4.

The two higher-than-usual $^{14}C/C$ values are shown in Table I in bold print. I did contact the University of Arizona AMS Lab regarding them. Lab personnel said they were all measured on the

Figure 1. McCallum Field, well #13. August 27, 2013.

Figure 2. McElmo field, well# DC-9. One can see the two small 10 cc sample cylinders atop the sampling apparatus. May 29, 2014.

same run in the AMS device. The error bounds for the $^{14}C/C$ values are $\pm$ 0.1 pmc. Therefore the only reason for the marked differences must have been in the sample processing. That is because two samples are taken simultaneously at each wellhead, as can be seen in the accompanying photos (Figures 1 and 2). Thus, since it is the same gas in each of the two cylinders, the values should be similar as in that for well #5.

The McElmo Field

The McElmo field sampling was done on May 29, 2014 to compare carbon-14 values with noble gas values obtained by Gilfillan et al. (2008) in selected wells. Based on my earlier work, it appeared that there might be a mathematical correlation between ^{14}C and the $^{129}Xe/^{130}Xe$ values found previously in the Bravo Dome, Sheep Mountain, and McElmo fields. Four McElmo wells were chosen based on a spread of their $^{129}Xe/^{130}Xe$ values. However, no such ^{14}C - $^{129}Xe/^{130}Xe$ correlation appears for this field, and the hypothesis for its existence has been discarded.

Interestingly all four McElmo wells have $^{20}Ne/^{22}Ne$ values that are less than the air standard value. This is not usually the case for most CO_2 gas wells. However, the $^{21}Ne/^{22}Ne$ values are greater than the air reference standard, as are all the other noble gas ratios. This is what normally has been found in CO_2 gas wells. There is a plausible mechanism for the different $^{21}Ne/^{22}Ne$ values. Such a mechanism would come from previous production of neon by accelerated nuclear decay (ref. RATE) of uranium and magnesium found throughout the McElmo Dome area. The uranium decay would impact the alpha decay reactions on ^{24}Mg and ^{25}Mg, which produce ^{21}Ne and ^{22}Ne respectively. The $^{84}Kr/^{36}Ar$ and $^{129}Xe/^{130}Xe$ values are also

Well #	Depth feet	^{14}C PMC	^{20}Ne ^{22}Ne	^{21}Ne ^{22}Ne	^{40}Ar ^{36}Ar	^{84}Kr ^{36}Ar	^{129}Xe ^{130}Xe	$\delta^{13}C$ pdb	$\delta^{18}O$ smow
HE-2	8400	0.20 --	9.05	0.1119	14025	0.0256	6.6189	-4.367	15.09
SC-9	8025	0.20 0.20	8.62	0.1109	16296	0.0320	6.5688	-4.075	15.70
YB-2	8300	0.25 0.31	8.90	0.1112	15513	0.0346	6.5883	-4.224	14.83
DC-9	8675	0.20 0.20	8.82	0.0788	8069	0.0230	6.5400	-4.564	15.81
Air		*100*	*9.80*	*0.029*	*295.5*	*0.0207*	*6.48*	*-7.05*	*23.5*

Table II. McElmo Well Gas Data

greater than the air value as expected. Ballentine and Holland (2008) reported some $^{40}Ar/^{36}Ar$ data that are consistent with that given above: HE-2 = 14297; SC-9 = 16420; YB-2 = 14425. These values are only 7% less than the Table II values. The McElmo wells had wellhead pressures between 640 to 755 psig. All wells except DC-9 contained 98% CO_2. The DC-9 well had only 73% CO_2, 20% N_2, 4% CH_4, and 3% other impurities such as H_2S.

Conclusions

Once again, supposedly very ancient CO_2 well gas is not carbon-14 dead. The $^{14}C/C$ values for all the sampled wells fell within the range of 0.20 to 0.31 (with the exception of two spurious values of 0.94 and 2.97). Thus, the conventional age of the sampled gases is on the order of 51,000 to 47,700 years. This points to a young earth age that is thousands, not billions of years.

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