Solar noble gases in Tagish Lake

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Tagish Lake fell in January 2000 [1] and is an ungrouped C2 meteorite and a 'breccia at all scales' [2]. Originally two different lithologies, a carbonate-rich one and a carbonate-poor one [2] were recognized, but additional work has revealed that there are even more distinct lithologies [3-5].

Analysis of the carbonate-rich lithology by [6] found abundant primordial noble gas, but solar noble gases were absent. A similar result was obtained by [7] in the analysis of a 'whole-rock' sample. Here we report noble gas data for a carbonate-poor sample of Tagish Lake, which, besides the primordial noble gases contains abundant solar gas.

We analyzed two samples. A smaller sample (#1; 20.2 mg) was heated in three temperature steps (600, 1000, 1800 °C), while a larger sample (#2; 93.9 mg) was heated in 200 °C increments from 400 °C to 1800 °C. Results for He, Ne and Ar are summarized in the Table below. Primordial Kr and Xe were also found at typical abundance levels relative to Ar ($^{36}Ar/^{84}Kr/^{132}Xe$ ~ 80/0.85/1).

#	^{3}He	^{4}He	^{22}Ne	20/22	21/22	^{36}Ar
1	5.99	16774	7.77	10.12	0.0851	90.3
2	8.35	22745	11.45	10.42	0.0853	96.4

Based on the presence of texturally and mineralogically distinct clasts, Nakamura *et al*. [6] concluded that the carbonate-rich lithology they studied is a breccia, however distinct from an asteroidal regolith breccia which would be characterized by the presence of solar noble gases. Our results indicate that there are other lithologies of Tagish Lake that in fact show solar wind gases. This and also the difference in cosmogenic ^{21}Ne (in 10^{-8} cc/g units: 0.46 and 0.64 in our samples vs. 0.114 in [6]) indicate that different lithologies / clasts of Tagish Lake may have experienced quite different irradiation histories.

[1] Brown *et al*. (2000) *Science* **290**, 320–325. [2] Zolensky *et al*. (2002) *MAPS* **37**, 737–761. [3] Blinova *et al*. (2009)*LPSC* **XL**, #2039. [4] DeGregorio *et al*. (2010) *MAPS* **45**, A69. [5] Izawa *et al*. (2010) *MAPS* **45**, 675–698. [6] Nakamura *et al*. (2003) *EPSL* **207**, 83–101. [7] Grady *et al*. (2001) *MAPS* **36**, A71-A72.

Investigation the use of ozonation column for phenol removal

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The phenol and this compound are highly toxic and carcinogenic. This pollutant can be observed in the effluents of many industries such as petroleum refining, coal tar distillation and coke in steel mills [1-3]. Advanced oxidation specific ozonation was considered for water treatment as the potential research interest in recent years. Ozonation has a high capacity and suitable for remove phenol. Effective factors were evaluated initial phenol concentration, pH, H_2O_2 volume and Duration ozonation. The results of ozonation were shown that the percentage removal of phenol was related to time. Increased phenol concentration decrease phenol removal rate so that maximum of the percentage removal was obtained for 100, 200 and 300 ppm phenol respectively after 20, 35 and 55 min (Figure 1). The experiments were carried out in pH of 2, 4, 7 and 9. The results were illustrated in table 1.

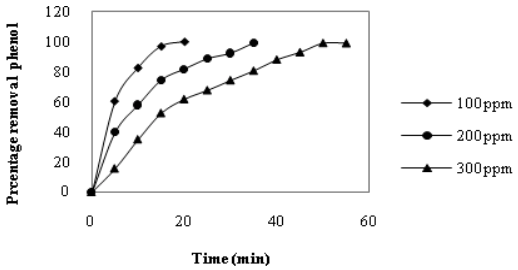

Figure 1: Effect of initial phenol concentration on removal

pH	2	4	7	9
Percentage removal 10 min (%)	55.18	65.12	70	95.3

Table 1: Effect of pH on phenol removal after 10 min

The most advantages of this study were the design of ozonation column and using a ozone diffuser that led to increase the percentage phenol removal in the shortest time possible. The optimum pH was 9 for remove phenol from wastewater and also increased H_2O_2 had little effect on removal.

[1] Moussavi *et al*. (2009*) J.Hazard. Mater*. **171**, 175–181.