ABUNDANCES AND OXYGEN ISOTOPIC COMPOSITIONS OF PRESOLAR SPINEL GRAINS. E. Zinner[1], S. Amari[1], R. Guinness[1], A. Nguyen[1], and R. S. Lewis[2], [1]Laboratory for Space Sciences and the Physics Department, Washington University, St. Louis, MO 63130, USA, [2]Enrico Fermi Institute, University of Chicago, Chicago, IL 60637, USA.

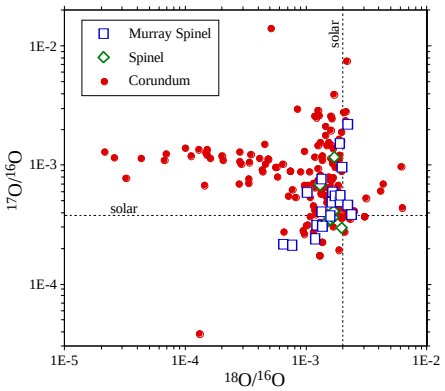
Presolar spinel grains are rare (Table 1). Before we started the present series of NanoSIMS measurements on small spinel grains only seven presolar spinels had been identified.

Table 1. PRESOLAR OXIDE GRAINS

Meteorite	Corundum	Spinel	Hibonite	Ti-oxide	Unident.
Acfer 094	4				
Bishunpur	7				
LEW90500	1				
Murchison	1	**1**			5
OC (Bish+Sem)	24	**3**	3	1	9
Orgueil	3				
Semarkona	19	**1**	2		
Tieschitz	123	**2**			1
Sum	**182**	**7**	**5**	**1**	**15**

Data are from [1-5] and unpublished data by L. Nittler.

Most of the grains listed in Table 1 are 1µm in diameter or larger. The NanoSIMS provides the capability to measure the isotopic compositions of much smaller grains. We have expanded NanoSIMS O isotopic measurements of spinel in the Murray residue CF [6, 7] (average grain size 0.15 µm) from 328 grains [8] to a total of 628 grains. In addition, we measured 270 spinel grains from Murray residue CG [6] (average grain size 0.45µm). We identified 18 presolar spinels among the 628 CF grains but only one presolar spinel among the 270 CG grains. It appears that the abundance of presolar spinels is much higher (~3%) among small (0.15µm) grains than among larger grains. The abundances among CG grains is ~0.4% and abundances among ≥1µm Bishunpur and Semarkona spinels [3-5] and Tieschitz spinels [1] are ≤0.8% and <0.1%, respectively.



In the figure we plot the O isotopic ratios of the newly measured spinel grains from Murray together with those of previously measured spinel and corundum grains [1-4]. We note that spinel grains do not show large ^{18}O depletions explained by cool bottom processing [9]. There is also a trend of spinel grains to show ^{17}O and ^{18}O depletions (left lower quadrant). Such depletions indicate low-metallicity parent stars [1]. However, better statistics is required to confirm these conclusions.

References: [1] Nittler L. R. *et al.* (1997) *ApJ, 483,* 475-495. [2] Nittler L. R. and Alexander C. M. O'D. (1999) *LPS XXX,* Abstract #2041. [3] Choi B.-G. *et al.* (1998) *Science, 282,* 1284-1289. [4] Choi B.-G. *et al.* (1999) *ApJ, 522,* L133-L136. [5] Krestina N. *et al.* (2002) *LPS XXXIII,* Abstract #1425. [6] Tang M. and Anders E. (1988) *GCA, 52,* 1235-1244. [7] Zinner E. and Tang M. (1988) *LPS XIX,* 1323-1324. [8] Zinner E. *et al.* (2002) *LPS XXXIII,* Abstract #1207. [9] Wasserburg G. J. *et al.* (1995) *ApJ, 447,* L37-L40.