

Supplementary Materials

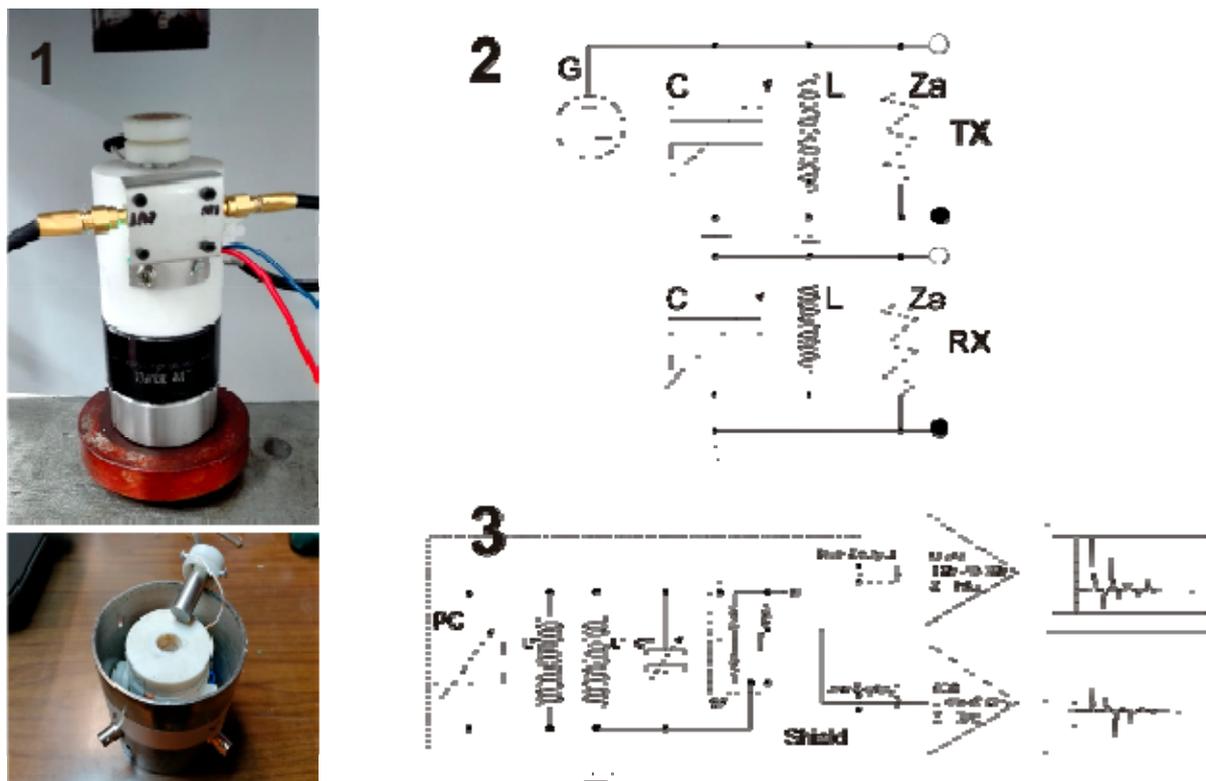
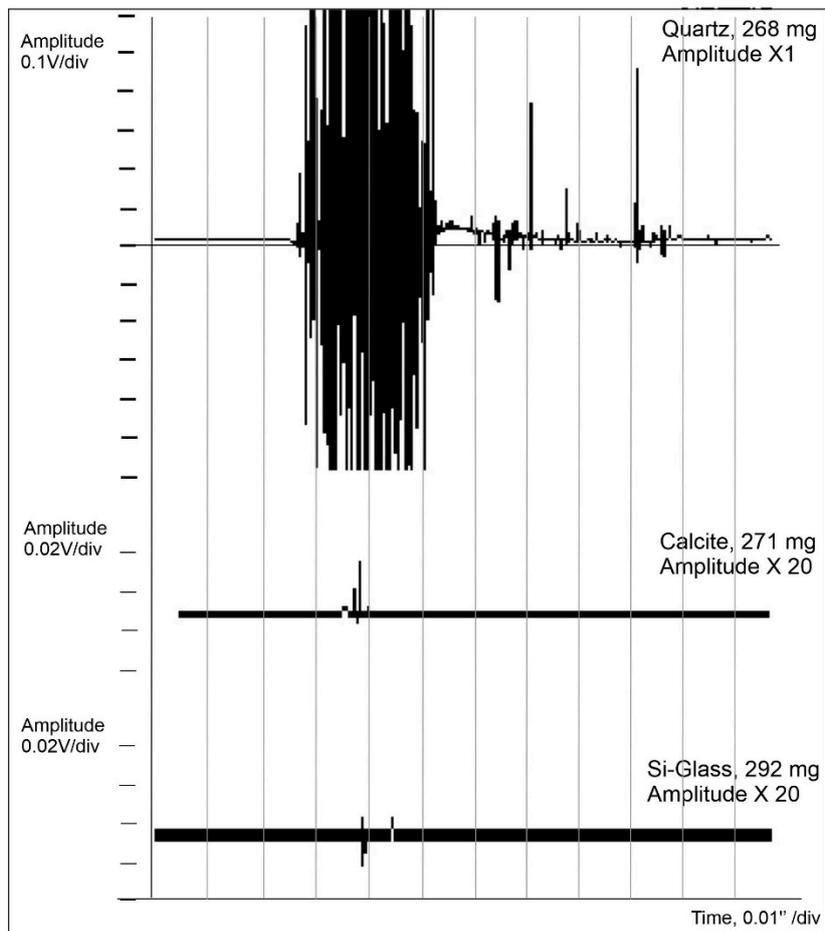


Figure S1: 1 = Layout of "Piston Condenser" apparatus, without coil and shield; 2= Equivalent electric scheme: TX, transmitting antenna, RX, receiving antenna; 3= Electric scheme: PC, piston cylinder (variable condenser), L' transmitting coil, L'' receiving coil, C' tuning capacity, SF, MOSFET source follower



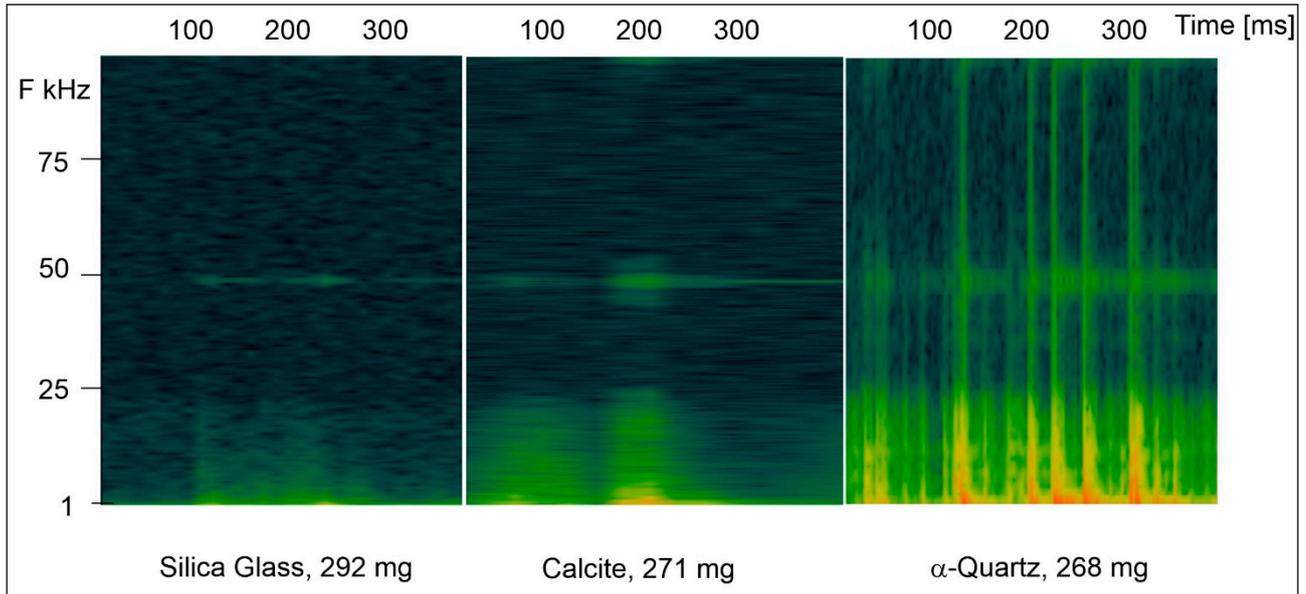


Figure S2: The signals from the first cracks for quartz, silica glass and calcite crystals, with the same amplifier conditions; the first waveform has a total amplitude of 1.1 V; the second has 0.025 V, the third 0.013 V. In the figure below, the FFT spectrum for LF emission for the three samples above

Table 1. Particles data from quartz samples.

Weight	Real stress	Particles	Totale area	Tot. volume	Tot. perimeter	Spec. Energy	Fracture Energy		E EMR LF	E EMR MF
mg	kg/cm ²	n	cm ²	cm ³	m	J/g	J/cm ²	%	J/g	J/g
10	2706	29046	0.45	0.0037	10	231	0.06	0.03	9.87×10^{-8}	5.95×10^{-8}
20	2655	45695	0.94	0.0074	21	125	0.06	0.05	3.99×10^{-8}	4.13×10^{-8}
26	2626	20928	1.47	0.0096	30	100	0.05	0.05	2.83×10^{-8}	3.60×10^{-8}
27	2621	172636	2.01	0.0100	73	97	0.04	0.04	2.69×10^{-8}	3.53×10^{-8}
33	2591	75173	2.23	0.0122	43	82	0.04	0.05	2.07×10^{-8}	$3.17E-08$
38	2566	302696	3.49	0.0141	135	74	0.03	0.04	$1.72E-08$	2.95×10^{-8}
41	2552	114256	2.02	0.0152	52	70	0.05	0.08	1.56×10^{-8}	2.83×10^{-8}
47	2523	115576	3.65	0.0174	86	63	0.03	0.05	1.31×10^{-8}	2.63×10^{-8}
52	2499	157036	4.43	0.0193	113	58	0.03	0.05	1.14×10^{-8}	2.50×10^{-8}
58	2470	192185	5.28	0.0215	166	54	0.03	0.05	9.92×10^{-9}	2.36×10^{-8}
61	2456	99265	4.15	0.0226	104	52	0.04	0.08	9.29×10^{-9}	$2.30E-08$
76	2385	491716	6.16	0.0281	233	44	0.03	0.07	6.97×10^{-9}	2.04×10^{-8}
77	2381	109990	6.99	0.0285	191	44	0.03	0.07	6.85×10^{-9}	2.03×10^{-8}
92	2312	81235	9.01	0.0341	263	39	0.03	0.07	5.43×10^{-9}	1.85×10^{-8}
98	2284	50883	4.93	0.0363	103	37	0.05	0.14	5.00×10^{-9}	1.79×10^{-8}
99	2280	196945	9.77	0.0367	295	37	0.03	0.07	4.93×10^{-9}	1.78×10^{-8}
100	2275	93435	11.97	0.0370	451	37	0.02	0.06	4.87×10^{-9}	1.77×10^{-8}
102	2266	237760	7.91	0.0378	247	36	0.03	0.09	4.74×10^{-9}	1.75×10^{-8}
102	2266	237760	7.91	0.0378	247	36	0.03	0.09	4.74×10^{-9}	1.75×10^{-8}
110	2231	106923	7.95	0.0407	243	35	0.04	0.11	4.30×10^{-9}	1.68×10^{-8}
113	2217	58438	6.90	0.0419	149	34	0.04	0.13	4.15×10^{-9}	1.66×10^{-8}
113	2217	58438	6.90	0.0419	149	34	0.04	0.13	4.15×10^{-9}	1.66×10^{-8}
154	2041	317130	12.71	0.0570	541	28	0.03	0.12	2.77×10^{-9}	1.41×10^{-8}
164	1999	171747	17.82	0.0607	593	26	0.02	0.09	2.55×10^{-9}	1.36×10^{-8}
171	1971	109201	12.02	0.0633	383	26	0.04	0.15	2.41×10^{-9}	1.33×10^{-8}
172	1967	51912	15.13	0.0637	669	26	0.03	0.12	2.40×10^{-9}	1.33×10^{-8}
172	1967	51912	15.13	0.0637	669	26	0.03	0.12	2.40×10^{-9}	1.33×10^{-8}
186	1910	283871	16.89	0.0689	640	24	0.03	0.12	2.16×10^{-9}	1.28×10^{-8}
186	1910	283871	16.89	0.0689	640	24	0.03	0.12	2.16×10^{-9}	1.28×10^{-8}
193	1882	226102	14.87	0.0715	404	23	0.03	0.15	2.06×10^{-9}	1.25×10^{-8}
218	1786	183255	40.79	0.0807	3325	21	0.01	0.07	1.76×10^{-9}	1.17×10^{-8}
225	1759	428119	29.29	0.0833	2271	21	0.02	0.10	1.69×10^{-9}	1.15×10^{-8}

225	1759	428119	29.29	0.0833	2217	21	0.02	0.10	1.69×10^{-9}	1.15×10^{-8}
250	1667	269387	27.15	0.0926	1148	19	0.02	0.13	1.47×10^{-9}	1.09×10^{-8}
262	1625	272584	30.90	0.0970	1527	19	0.02	0.12	1.38×10^{-9}	1.07×10^{-8}
262	1625	272584	30.90	0.0970	1527	19	0.02	0.12	1.38×10^{-9}	1.07×10^{-8}
309	1466	192445	27.26	0.1144	1634	16	0.03	0.19	1.11×10^{-9}	9.77×10^{-9}
309	1466	192445	27.26	0.1144	1634	16	0.03	0.19	1.11×10^{-9}	9.77×10^{-9}
319	1434	163091	39.22	0.1181	1115	16	0.02	0.14	1.07×10^{-9}	9.61×10^{-9}
326	1411	183119	30.48	0.1207	1012	15	0.03	0.19	1.04×10^{-9}	9.50×10^{-9}
326	1411	183119	30.48	0.1207	1012	15	0.03	0.19	1.04×10^{-9}	9.50×10^{-9}
347	1347	138021	37.30	0.1285	1061	14	0.02	0.17	9.57×10^{-10}	9.19×10^{-9}
350	1338	1.31E+06	35.95	0.1296	2584	14	0.03	0.18	9.47×10^{-10}	9.15×10^{-9}
358	1314	346339	33.16	0.1326	1762	14	0.03	0.21	9.19×10^{-10}	9.04×10^{-9}
358	1314	346339	33.16	0.1326	1762	14	0.03	0.21	9.19×10^{-10}	9.04×10^{-9}
409	1172	157295	43.59	0.1515	1230	12	0.03	0.21	7.72×10^{-10}	8.43×10^{-9}
437	1100	177677	53.09	0.1619	1548	11	0.02	0.20	7.08×10^{-10}	8.14×10^{-9}
454	1059	132383	61.28	0.1681	2202	11	0.02	0.18	6.74×10^{-10}	7.98×10^{-9}
506	945	895910	53.94	0.1874	3618	9	0.03	0.27	5.85×10^{-10}	7.53×10^{-9}
512	933	163557	78.04	0.1896	4407	9	0.02	0.19	5.76×10^{-10}	7.49×10^{-9}
518	921	361858	90.87	0.1919	7206	9	0.02	0.17	5.67×10^{-10}	7.44×10^{-9}
532	894	352763	54.89	0.1970	1927	9	0.03	0.29	5.48×10^{-10}	7.34×10^{-9}
556	850	1.25E+06	78.54	0.2059	5971	8	0.02	0.23	5.17×10^{-10}	7.17×10^{-9}
559	845	115735	49.96	0.2070	1282	8	0.03	0.36	5.13×10^{-10}	7.15×10^{-9}
670	691	602514	73.85	0.2481	7162	7	0.02	0.36	4.05×10^{-10}	6.50×10^{-9}
862	600	396885	136.47	0.3193	2535	6	0.02	0.30	2.91×10^{-10}	5.69×10^{-9}
1011	684	345304	106.49	0.3744	3969	6	0.03	0.40	2.37×10^{-10}	5.23×10^{-9}
1194	971	221486	141.22	0.4422	4761	9	0.02	0.26	1.90×10^{-10}	4.79×10^{-9}

Legenda:

Particles= Total particles in sample from Morphology measurements [n]

Total area, volume, perimeter= data from Morphology measurements

Specific energy = Pressure work vs weight of sample [J/g]

Fracture energy = Quartz surface energy vs total measured area [J/cm²]

Yield = percentage of energy [%]

E EMR LF = energy emitted as low frequency (0.1 – 100 kHz) [J/g]

E EMR MF = energy emitted as medium frequency (0.1 – 1 MHz) [J/g]