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14
5W

55-7-52

BULK MEASUREMENTS
CONSOLIDATED DATA AND SHIPPING DOCUMENT

Date: July 20, 1955
Submitted by: G. A. Essig

SHIPMENT NUMBER 4

1. Shipping Container Nos. 10, 11, 12 and 13 Containing 20 Size 2" Sample Cans for Analyses, 72 Size 4" Standard Cans, 64 Size 4" Dimple Cans and 44 Size 6" Standard Cans containing Grade A Material from Batch Numbers A-9, A-10, A-12, and A-15 to A-23 inclusive.

2. All Blocks are cured according to the specifications.

3. All Cans conform to dimensional specifications; however, sample blocks have not been gaged because they are intended to be used specifically for analytical purposes.

4. Chemical and Isotopic Analysis of the salt used in the above listed items:

a. Oak Ridge Raw Salt Analysis:

(1) $\frac{\text{grams of Lithium}}{\text{grams of salt}}$ = 0.6681

(2) $\frac{\text{grams of Deuterium}}{\text{grams of salt}}$ = 0.1976

(3) $\frac{\text{grams of } OH^-}{\text{grams of salt}}$ = 0.0695

(4) $\frac{\text{grams of } CO_3^=}{\text{grams of salt}}$ = 0.0199

(5) Alkali Metals:

Sodium	=	1500 p.p.m.
Potassium	=	780 p.p.m.
Calcium	=	450 p.p.m.
Atomic % Li^6	=	92.21
Wt. % Li^6	=	91.04

b. Mound Laboratory Analysis of Same Material:

(1) $\frac{\text{grams of Lithium}}{\text{grams of salt}}$ = 0.6802

(2) $\frac{\text{grams of Deuterium}}{\text{grams of salt}}$ = 0.1991 (average value)

(3) $\frac{\text{grams of } OH^-}{\text{grams of salt}}$ = 0.0555 (Liver. method)

(4) $\frac{\text{grams of } CO_3^=}{\text{grams of salt}}$ = 0.0236

(5) Alkali Metals:

Sodium	=	<100 p.p.m.
Potassium	=	0 p.p.m.
Calcium	=	0 p.p.m.

(6) $\frac{\text{Deuterium}}{\text{Hydrogen}}$ = $\frac{96.28}{3.72}$

MOUND DECLASSIFICATION REVIEW
1ST REVIEW-DATE 3/10/95
AUTHORITY ☐ AOC ☒ ADC ☐ ADD
NAME Tim Flannagan
2ND REVIEW-DATE 3/10/98
AUTHORITY ADD
NAME [illegible]
DETERMINATION (CIRCLE NUMBER(S))
1. CLASSIFICATION RETAINED
2. CLASSIFICATION CHANGED TO
3. CONTAINS NO DOE CLASSIFIED INFO
4. COORDINATE WITH
5. CLASSIFICATION CANCELLED
6. CLASSIFIED INFO BRACKETED
7. OTHER (SPECIFY)

c. Mound Laboratory Analysis of Pressed Blocks:

(1) $\frac{\text{grams of Lithium}}{\text{grams of salt}}$ = 0.6995 (average)

(2) $\frac{\text{grams of Deuterium}}{\text{grams of salt}}$ = 0.1919 (average)

(3) $\frac{\text{grams of OH}}{\text{grams of salt}}$ = See LiOH Content

(4) $\frac{\text{grams of } CO_3}{\text{grams of salt}}$ = 0.00446

(5) Alkali Metals:

Sodium	=	< 200 p.p.m.
Potassium	=	0 p.p.m.
Calcium	=	0 p.p.m.

(6) $\frac{\text{Deuterium}}{\text{Hydrogen}}$ = $\frac{96.65}{3.35}$

d. Degradation of material resulting from handling and processing < 1%.

5. **The density of all fabricated units is equal or greater than 93% of theoretical densi (accounting for detectable impurities), and is no greater than ± 1% of the arithmetical mean.**

LiOH content of canned blocks curing batches:

Curing Batch No.		Curing Batch No.	
A- 9	1200 p.p.m.	A-18	500 p.p.m.
A-10	1000 p.p.m.	A-19	700 p.p.m.
A-12	2000 p.p.m.	A-20	2000 p.p.m.
A-15	700 p.p.m.	A-21	1100 p.p.m.
A-16	2100 p.p.m.	A-22	1100 p.p.m.
A-17	1100 p.p.m.	A-23	2000 p.p.m.

Remarks: Most of the cured blocks contain salt from the second 25 kilogram shipment from Oak Ridge and consequently results are erratic. In addition to the remarks made in the report of the previous shipment (No. 3), the following physical characteristics were noted:

1. The blocks when cracked for gas samples tended to powder much more easily than batches prepared from earlier raw salt material.

2. The color of the salt in the center of the block (not the surface) was a darker color (possibly F-centers) than any of the salt samples from other batches.

These characteristics were noted in all of the samples made from blocks taken from these batches.

GAE/cjw

Distribution:

Copy 1 - O. Meadors - University of California
Radiation Laboratory
Livermore, California (1 enc.)

2 E. A. Walker
3 E. C. McCarthy
4 G. A. Essig (1 enc.)
5 Central Files

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH A-9
Packed in Container No. 12

Can Number	Gross Weight (Grams)	Net Salt Weight (Grams)	
A-1202	107.1855	91.1282	Dimple 4-inch cans
A-1203	107.6848	91.0387	" " " "
A-1204	106.6066	90.9691	" " " "
A-1205	106.0282	90.9944	" " " "
A-1206	105.7163	90.9093	" " " "
A-1207	106.4024	90.9210	" " " "
A-1208	106.6191	90.9710	" " " "
A-1209	106.8906	90.9453	" " " "
A-1216	107.7297	91.2228	" " " "
A-1217	107.4050	90.9612	" " " "
A-1218	106.4556	90.9345	" " " "
A-1219	106.9441	90.9889	" " " "
A-1220	106.5259	90.9489	" " " "
A-1222	106.4293	91.0497	" " " "
A-1223	106.4031	90.9851	" " " "
A-1224	106.8413	91.0623	" " " "
A-1225	106.1827	91.1102	" " " "
A-1227	105.3610	90.8715	" " " "
A-1228	106.7032	90.9536	" " " "
A-1229	107.4247	90.9845	" " " "
A-1232	107.3444	90.9982	" " " "
A-1233	107.5766	90.9890	" " " "
A-1234	108.8836	91.4945	" " " "
A-1235	107.0682	90.9539	" " " "
A-1236	107.1169	90.9983	" " " "
A-1237	107.5460	91.0203	" " " "
A-1239	107.9190	91.1179	" " " "
A- 17	28.2797 (Sample)	22.8076	Standard 2-inch cans
A- 18	28.5958 (Sample)	22.8016	" " " "
Total	2943.8693	2503.1315	

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH A-10
Packed in Container No. 12

Can Number		Gross Weight (Grams)		Net Salt Weight (Grams)	
A-1438		106.9516		90.8908	Dimple 4-inch cans
A-1444		106.0644		90.8901	" " " "
A-1447		106.5113		90.8816	" " " "
A-1494		107.4481		90.9064	" " " "
A-1496		107.4595		90.9251	" " " "
A-1497		107.0439		90.9973	" " " "
A-1498		106.2930		90.9817	" " " "
A-1500		107.3301		90.8519	" " " "
A-1505		106.4132		90.9028	" " " "
A-1507		106.5800		90.7585	" " " "
A-1510		105.9067		90.9898	" " " "
A- 30		28.1760	(Sample)	22.8068	Standard 2-inch cans
A- 36		28.1705	(Sample)	22.5408	" " " "
	Total	1230.3383		1045.3236	

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH A-12
Packed in Container No. 11

Can Number		Gross Weight (Grams)		Net Salt Weight (Grams)	
A-1406		108.1986		91.2159	Standard 4-inch cans
A-1523		107.3307		91.2410	" " " "
A-1524		107.7328		91.2625	" " " "
A-1525		107.7551		91.2083	" " " "
A-1528		107.5445		91.2275	" " " "
A-1529		107.7763		91.2540	" " " "
A-1531		108.8638		91.2118	" " " "
A-1532		107.5777		91.1865	" " " "
A- 67		27.8125	(Sample)	22.7799	Standard 2-inch cans
	Total	890.5920		752.5874	

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH A-15
Packed in Container No. 10

Can Number		Gross Weight (Grams)	Net Salt Weight (Grams)	
A-2068		235.1	205.1362	Standard 6-inch cans
A-2069		235.9	205.1902	" " " "
A-2070		234.7	205.1854	" " " "
A-2071		238.3	205.1268	" " " "
A-2072		239.3	205.2369	" " " "
A-2074		235.0	205.2150	" " " "
A-2075		235.8	205.1547	" " " "
A-2076		238.0	205.2214	" " " "
A-2078		235.5	205.2021	" " " "
A-2114		239.6	205.1731	" " " "
	Total	2367.2	2051.8418	

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH A-16
Packed in Container No. 11

Can Number	Gross Weight (Grams)		Net Salt Weight (Grams)	
A-1538	108.3807		90.6050	Standard 4-inch cans
A-1539	107.5430		90.4874	" " " "
A-1541	108.0900		90.5314	" " " "
A-1547	109.1324		90.6881	" " " "
A-1551	108.4073		90.7122	" " " "
A-1591	109.2222		90.6888	" " " "
A-1606	108.9394		90.5802	" " " "

Packed in Container No. 10

A-2083	237.0		203.2919	Standard 6-inch cans
A-2087	237.9		203.9471	" " " "
A-2088	237.5		203.1297	" " " "
A-2089	238.0		203.1096	" " " "
A-2091	238.8		203.5851	" " " "
A-2096	238.6		203.6586	" " " "

Packed in Container No. 11

A- 99	28.0817	(Sample)	22.6300	Standard 2-inch cans
A- 127	28.0847	(Sample)	22.6479	" " " "
Total	2243.6814		1900.2930	

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH A-17
Packed in Container No. 11

Can Number	Gross Weight (Grams)		Net Salt Weight (Grams)	
A-1429	107.8276		90.5208	Standard 4-inch cans
A-1534	108.1029		90.8282	" " " "
A-1535	107.9831		90.3924	" " " "
A-1543	107.8293		90.5988	" " " "
A-1546	108.0903		90.4920	" " " "
A-1548	109.0359		90.6440	" " " "
A-1549	108.4245		90.4920	" " " "
A-1550	107.6255		90.6440	" " " "
A-1552	107.4338		90.5656	" " " "
A-1556	107.4540		90.5676	" " " "
A-1557	107.2607		90.4808	" " " "
A-1559	107.7330		90.5676	" " " "
A-1560	108.0381		90.5684	" " " "
A-1561	107.6730		90.6928	" " " "
A-1562	107.9621		90.5208	" " " "
A-1563	107.3328		90.5656	" " " "
A-1567	107.5324		90.1944	" " " "
A-1568	108.3604		90.5624	" " " "
A-1569	108.3803		90.6464	" " " "
A-1570	106.7878		90.4354	" " " "
A-1571	107.4586		90.7111	" " " "
A-1572	107.9723		90.3604	" " " "
A-1573	106.8442		90.7348	" " " "
A-1574	107.4983		90.8368	" " " "
A-1575	107.9779		90.6644	" " " "
A-1576	107.8059		90.6604	" " " "
A-1577	107.0920		90.6847	" " " "
A-107	27.9580	(Sample)	22.4675	Standard 2-inch cans
A-111	28.2004	(Sample)	22.4960	" " " "
Total	2965.6751		2490.5961	

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH A-18
Packed in Container No. 10

Can Number		Gross Weight (Grams)		Net Salt Weight (Grams)	
A-2015		237.935		204.3629	Standard 6-inch cans
A-2021		239.400		202.5710	" " " "
A-2022		240.342		204.5060	" " " "
A-2026		237.000		204.3850	" " " "
A-2030		236.532		204.0480	" " " "
A-2035		236.245		205.2941	" " " "
A-2036		237.367		204.6286	" " " "
A-2037		236.534		204.4612	" " " "
A- 64		28.1382	(Sample)	22.7218	Standard 2-inch cans
	Total	1929.4932		1656.9786	

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH NO. 19
Packed in Container No. 11

Can Number	Gross Weight (Grams)	Net Salt Weight (Grams)	
A-1540	107.3752	90.4424	Standard 4-inch cans
A-1564	108.3682	90.4780	" " " "
A-1566	108.6723	90.4978	" " " "
A-1578	108.4547	90.5475	" " " "
A-1579	108.8954	90.6874	" " " "
A-1581	108.0798	90.4070	" " " "
A-1582	108.0441	90.8692	" " " "
A-1583	108.4025	90.4668	" " " "
A-1584	109.0117	90.3705	" " " "
A-1585	107.5356	90.4760	" " " "
A-1586	108.5045	90.8095	" " " "
A-1587	109.5256	90.8850	" " " "
A-1588	108.0545	90.9734	" " " "
A-1589	108.2094	90.4780	" " " "
A-1590	108.0682	90.4403	" " " "
A-1592	108.7044	90.3600	" " " "
A-1593	108.5919	90.7534	" " " "
A-1594	108.8368	90.8508	" " " "
A-1595	108.7754	90.5674	" " " "
A-1596	107.6949	90.4424	" " " "
A-1597	109.7646	90.9734	" " " "

Packed in Container No. 13

A-1598	109.0484	90.4553	Standard 4-inch cans
A-1600	107.3405	90.4548	" " " "
A-1602	108.2042	90.3296	" " " "
A-1603	107.8077	90.5608	" " " "
A-1604	108.6545	90.5617	" " " "
A-1605	107.4887	90.5617	" " " "
A-1607	108.3427	90.5060	" " " "
A-1608	108.2404	90.3908	" " " "
A-1618	107.1319	90.3404	" " " "

Packed in Container No. 10

A- 75	27.8264	(Sample)	22.4336	Standard 2-inch cans
A- 97	28.3506	(Sample)	22.5391	" " " "
Total	3306.0057		2761.9100	

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH NO. 20
Packed in Container No. 10

Can Number	Gross Weight (Grams)		Net Salt Weight (Grams)	
A-2039	240.75		204.0189	Standard 6-inch cans
A-2059	234.70		203.9898	" " " "
A-2066	236.50		204.0198	" " " "
A-2073	236.25		204.0139	" " " "
Packed in Container No. 13				
A-2077	237.1		203.6681	Standard 6-inch cans
A-2095	237.8		203.7056	" " " "
A-2110	237.9		203.6790	" " " "
A-2121	237.8		203.5873	" " " "
A-2123	238.9		203.6603	" " " "
A-2127	241.4		203.8034	" " " "
A- 74	28.2358	(Sample)	22.4890	Standard 2-inch cans
A- 108	27.9430	(Sample)	22.4890	" " " "
Total	2435.2788		2083.1241	

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH NO. 21
Packed in Container No. 12

Can Number	Gross Weight (Grams)		Net Salt Weight (Grams)	
A-1609	107.2736		90.0550	Dimple 4-inch cans
A-1610	106.7041		90.0813	" " " "
A-1611	107.0148		90.0594	" " " "
A-1612	107.3038		90.0594	" " " "
A-1616	107.3500		90.0550	" " " "
A-1620	105.9445		90.2452	" " " "
A-1626	106.8133		90.2361	" " " "
A-1630	105.9157		90.0736	" " " "
A-1631	106.2001		90.2746	" " " "
A-1634	105.2825		90.0932	" " " "
A-1638	106.1838		90.0797	" " " "
A-1649	105.3688		90.1750	" " " "
A-1652	105.2444		90.1344	" " " "
A-1654	105.8522		90.0232	" " " "
A-1658	106.2462		90.2746	" " " "
A-1662	106.0278		90.1463	" " " "
A-1665	105.9700		90.2223	" " " "
Packed in Container No. 13				
A-1601	107.1967		90.3695	Standard 4-inch cans
A-1613	108.0945		90.8384	" " " "
A-1617	107.2978		90.3540	" " " "
Packed in Container No. 12				
A- 95	28.3267	(Sample)	22.5592	Standard 2-inch cans
A- 104	28.1998	(Sample)	22.5592	" " " "
Total	2185.8111		1848.9686	

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH No. 22
Packed in Container No. 12

Can Number	Gross Weight (Grams)		Net Salt Weight (Grams)	
A-1615	107.3398		90.3241	Dimple 4-inch cans
A-1621	107.0644		90.1760	" " " "
A-1623	107.2754		90.2007	" " " "
A-1629	105.5847		90.2493	" " " "
A-1635	106.1640		90.1805	" " " "
A-1636	106.3632		90.1665	" " " "
A-1640	106.4930		90.2793	" " " "
A-1642	106.9229		90.1760	" " " "

Packed in Container No. 13

A-2172	238.8		203.3616	Standard 6-inch cans
A-1664	106.7561		90.1805	Standard 4-inch can
A- 96	28.1326	(Sample)	22.5728	Standard 2-inch cans
A- 116	28.1961	(Sample)	22.5728	Standard 2-inch cans
Total	1255.0922		1060.4401	

LITHIUM DEUTERIDE
(Enriched)

SHIPMENT NUMBER 4

BATCH No. 23
Packed in Container No. 13

Can Number		Gross Weight (Grams)		Net Salt Weight (Grams)	
A-2090		241.0		203.0775	Standard 6-inch cans
A-2093		239.8		204.0346	" " " "
A-2094		239.0		203.9441	" " " "
A-2099		241.25		203.9591	" " " "
A-2101		239.1		203.6809	" " " "
A-2115		241.1		203.0672	" " " "
A-2116		240.5		203.5996	" " " "
A-2117		239.0		204.2616	" " " "
A-2118		239.1		203.7176	" " " "
A- 109		28.2952	(Sample)	22.6556	Standard 2-inch cans
A- 23		28.2735	(Sample)	22.5728	" " " "
	Total	2216.4187		1878.5706	