

Summary of Data Included in Subsequent Tables by Category

Date Published	Material Studied	Storage Media	Method of Accelerating Degradation	Container	Table No.	Quantification Technique	Comments	Reference
GASOLINE								
1956	Gasoline	None	0.4, 0.12, 10, 20 wk/43 ° C	Glass	2	Filtr. and weight; D-381 and Polarography		121, 122, 105
1957	Gasoline	None	0.20 wk/43 ° C	Glass	3	Filtr. and weight; D-381 and Polarography		122, 105
1958	Gasoline	None	0.20 wk/43 ° C	Glass	4	Filtr. and weight; D-381		124
	Gasoline	None	2.5, 12, 18, 24, 72, 120 hr/uv	Glass	5	Vapor transfer and weight		125
	Gasoline	None	24 hr/uv/ambient	Glass	6	Sulfur det.		125, 105
	Gasoline	None	2.0, 12, 18, 24 hr/uv/ambient	Glass	7	Sulfur det.		125, 105
	Gasoline	None	24 hr/uv/ambient	Glass	8	Nitrogen det.		125, 105
	Gasoline	None	2.5, 12, 18, 24 hr/uv/ambient	Glass	9	Nitrogen det.		125, 105
1959	Tritium labeled epds	Gasoline	0.8, 16, 24 wk/43 ° C	Glass	10	Vapor transfer and weight; D-381 and radioactivity		125, 125
	Tritium labeled epds	Gasoline	0.8, 16, 24 wk/43 ° C	Glass	11	Vapor transfer and weight; D-381 and radioactivity		125
	Tritium labeled epds	Gasoline	0.8, 16, 24 wk/43 ° C	Glass	12	Vapor transfer and weight; D-381 and radioactivity		125
	Tritium labeled epds	Gasoline	0.8, 16, 24 wk/43 ° C	Glass	13	Vapor transfer and weight; D-381 and radioactivity		125
1959	Gasoline	None	0.8, 10, 24 wk/43 ° C	Glass	14	Vapor transfer and weight; D-381		127
1960	Labeled epds	Gasoline	0.8, 16 wk/43 ° C	Glass	15	Vapor transfer and weight; radioactivity		129, 130, 105
	Labeled epds	Gasoline	16 wk/43 ° C	Glass	16	Vapor transfer and weight; D-381 and radioactivity	Distribution of radioactivity	129
	Labeled epds	Gasoline	0.8, 16 wk/43 ° C	Glass	17	Vapor transfer and weight; radioactivity	Distribution of radioactivity	130, 105
	Labeled epds	Gasoline	0.8, 16 wk/43 ° C	Glass	18	Vapor transfer and weight; D-381 and radioactivity	Distribution of radioactivity	130
	Labeled epds	Gasoline	0.8, 16 wk/43 ° C	Glass	19	Vapor transfer and weight; D-381 and radioactivity	Contribution of fuel comp. to gum	130, 105
1962	Labeled epds	Syn. gasoline	0.8, 16 wk/43 ° C	Glass	20	Vapor transfer and weight; D-381 and radioactivity		131, 105
	Labeled epds	Syn. gasoline	0.8, 16 wk/43 ° C	Glass	21	Vapor transfer and weight; D-381 and radioactivity		131, 105
1965	Water	Gasoline	1 day, 1.3, 16, 32 wk/43 ° C	Glass	22	Vapor transfer and weight; D-381; O ₂ det.	Compare bomb vs bottle storage	100
	Labeled epds	Gasoline	0.3, 0.6, 16, 32 wk/43 ° C or 4.8, 16 hr/122 ° C	Glass or bomb	23	Vapor transfer and weight; D-381		101
1966	Gasoline and jet fuel	None	1.2, 3, 4.5, 6, wk/150 ° C	Amber glass	24	Det. of peroxide number		68
1966	Gasoline	None	0.3, 0.6, 16, 32 wk/43 ° C	Amber glass	25	Filtr. and weight; D-381; O ₂ det.		102, 3, 104
1967	Additives	Gasoline	3.8, 16, 32 wk/43 ° C	Amber glass	26	Filtr. and weight; D-381; O ₂ det.		96, 3, 104
	Additives	Gasoline	0.8, 16 hr/93 ° C	SS bomb	27	Filtr. and weight; D-381; O ₂ det.		96, 3, 104
	Gasoline	None	3.8, 16, 32 wk/43 ° C	Amber glass	28	Filtr. and weight; D-381; O ₂ det.	Comparison of actual vs predicted	96, 3
	Antioxidants	Gasoline	3.8, 16, 32 wk/43 ° C	Amber glass	29	Filtr. and weight; D-381; O ₂ det.	Comparison of actual vs predicted	96, 3
	Additives	Gasoline	3.8, 16, 32 wk/43 ° C	Amber glass	30	Filtr. and weight; D-381; O ₂ det.		96, 3

TABLE 1
Summary of Data Included in Subsequent Tables by Category -- continued

Date Published	Material Studied	Storage Media	Method of Accelerating Degradation	Container	Table No.	Quantification Technique	Comments	Reference
GASOLINE (cont'd)								
1967	Additives	Gasoline	3.8,16.32 wk/43 ° C	Amber glass	31	Filtr. and weigh	Inorganic residue correlation	96, 3
1968	Gasoline	None	0.8,16.32,44.52 wk/43 ° C	Amber glass	32	Filtr. and weigh; D-381		99
	Gasoline	None	16 hr/93 ° C	Amber glass	33	Filtr. and weigh; D-381		99
1969	Gasoline	None	8.16.32 wk/43 ° C	Amber glass	34	Filtr. and weigh; D-381	Comparison of actual vs predicted gum	2
	Gasoline	None	8.16.32 wk/43 ° C	Amber glass	35	Filtr. and weigh; D-381	Comparison of actual vs predicted gum	2
1969	Gasoline	None	16 hr/93 ° C and 8,16, 32.52 wk/43 ° C	Glass	36	Filtr. and weigh; D-381, D-2 det	Comparison of 43 ° C to 93 ° C	2, 104
	Gasoline	None	4,6.8,12 mo. / ambient	Collapsible plastic	37	D-381, ISO Index, D-525, D-2550		69
1970	Elastomers in fuel containers	Gasoline	0.6 mo./ambient	Glass	38	Filtr. and weigh; Reid V.P., oxidation stab.		11
1974	Gasoline	None	0.4,8.16.32 wk/43 ° C	Amber glass	39	Filtr. and weigh; D-381	10 gasolines studied	10
1979	Gasoline, leaded	None	0.4,8.16.32 wk/43 ° C	Amber glass	40	Filtr. and weigh; D-381	10 gasolines studied	10
	Gasoline, unleaded	None						
DIESEL								
1955	Diesel fuel	None	0 to 55 day/43 ° C and 55 ° C	Glass	41	Light scattering		55
1965	Diesel Fuel	None	4 wk/49 ° C	BS glass	42	Filtr. and weigh	Acc test vs 8 year storage	92
	Diesel Fuel	None	16 hr/99 ° C	BS glass	43	Filtr. and weigh	Acc test vs 6 year storage	92
1966	Diesel fuel marine	None	0.5,12.24.36 wk/43 ° C	BS glass	44	Filtr. and weigh; D-381, light trans		1
	Diesel fuel marine	None	12 wk/43 ° C or 16 hr/95 ° C	BS glass	45	Filtr. and weigh; D-381	Comparison of 43 ° C to 95 ° C	69
1970	Elastomers in fuel containers	Diesel	4,6.8,12 mo./ambient	Collapsible plastic	46	D-381, D-2274, D-524, D-2255		59
	Elastomers in fuel containers	Diesel	4,6.8,12 mo./ambient	Collapsible plastic	47	D-381, D-2274, D-524, D-2255		69
	Elastomers in fuel containers	Diesel	4,6.8,12 mo./ambient	Collapsible plastic	48	D-381, D-2274, D-524, D-2255		69
1970	Elastomers in fuel containers	Diesel	4,6.8,12 mo./ambient	Collapsible plastic	49	D-381, D-2274, D-524, D-2255		69
	Elastomers in fuel containers	Diesel	4,6.8,12 mo./ambient	Collapsible plastic	50	Filtr. and weigh	Measure particulates	70
1973	Diesel fuel	None	1 to 24 mo./ambient	Steel tanks	51	D-381	Measure soluble gum	70
	Diesel fuel	None	1 to 24 mo./ambient	Steel tanks	52	D-2274	Measure acc. stability	70
1979	No. 2 Diesel	None	0.4,8.16.32 wk/43 ° C	Amber glass	53	Filtr. and weigh; D-381	10 samples studied	10
1981	Diesel fuel	None	0.4,8.12,18.24 wk/43 ° C	BS glass	54	Filtr. and weigh; D-381		111
	Diesel fuel	None	0.4,8.12,18.24 wk/43 ° C	BS glass	55	Filtr. and weigh; D-381		111
	Diesel fuel	None	0.4,8.12,18.24 wk/43 ° C	BS glass	56	Filtr. and weigh; D-381		111
	Diesel fuel	None	0.4,8.12,18.24 wk/43 ° C	BS glass	57	Filtr. and weigh; D-381		111
	Diesel fuel	None	0.4,8.12,18.24 wk/43 ° C	BS glass	58	Filtr. and weigh; D-381		111
	Diesel fuel	None	0.4,8.12,18.24 wk/43 ° C	BS glass	59	Filtr. and weigh; D-381		111
	Diesel fuel	None	1 1/2 or 3 hr./150 ° C	BS glass	60	Filtr. and weigh; D-381		111
	Diesel fuel	None	3.7,14 days/80 ° C	BS glass	61	Filtr. and weigh; D-381		111
	Diesel fuel	None	16 hr/95 ° C with 0.2	BS glass	62	Filtr. and weigh; D-381		111

Summary of Data Included in Subsequent Tables by Category -- continued.

Date Published	Material Studied	Storage Media	Method of Accelerating Degradation	Container	Table No.	Quantification Technique	Comments	Reference
DIESEL (cont'd.)								
1981	Diesel fuel	None	4.8, 12 wk/43 ° C	BS glass	63	Filtr. and weigh; D-381	Compared vented and non-vented	111
	Diesel fuel	None	4.8, 12 wk/43 ° C	Glass	64	Filtr. and weigh; D-381	Compared vented and non-vented	111
	Diesel fuel	None	4.8, 12 wk/43 ° C	Glass	65	Filtr. and weigh; D-381	Compared vented and non-vented	111
1981	N cpds.	Diesel fuel	168 hr/121 ° C	Soft glass	66	Weight	Sediment on glass slip	143
1982	N cpds.	Diesel, jet fuel	7, 14, 28, 56, 80, 112 day/43 ° C	BS glass	67	Filtr. and weigh		39
	N cpds.	Diesel fuel	28, 56, 112 days/43 ° C	BS glass	68	Filtr. and weigh		39
	S cpds.	Diesel, jet fuel	28, 56, 160 day/43 ° C	BS glass	69	Filtr. and weigh		39
	N cpds.	Diesel, jet fuel	14, 28, 56, 73 day/43 ° C	BS glass	70	Filtr. and weigh		39
	N cpds.	Diesel, jet fuel	14, 28, 56, 73 day/43 ° C	BS glass	71	Filtr. and weigh		39
	N cpds.	Diesel, jet fuel	14, 28, 56, 73 day/43 ° C	BS glass	72	Filtr. and weigh		39
	N cpds.	Diesel, jet fuel	14, 28, 56, 73 day/43 ° C	BS glass	73	Filtr. and weigh		39
	N, S, O cpds	Diesel fuel	7, 14, 28, 56 day/43 ° C	BS glass	74	Filtr. and weigh		39
	N, S, O cpds	Diesel fuel	7, 14, 28, 56 day/43 ° C	BS glass	75	Filtr. and weigh		39
	N, S cpds	Diesel, jet fuel	7, 14, 28, 56, 80, 128 day/43 ° C	BS glass	76	Filtr. and weigh		39
	BMP and organic acids	Diesel, jet. decane	14, 28, 56 day/22 or 43 ° C	BS glass	77	Filtr. and weigh		39
	N cpds, hydrocarbons	Diesel, jet fuels	14, 28, 56 day/43 ° C	BS glass	78	Filtr. and weigh		39
	N cpds and olefins	Diesel, jet. decane	28 day/43 ° C	BS glass	79	Filtr. and weigh	Effect of temperature	39
	BMP	Diesel, jet. decane	14 day/43 ° C or 15-60 day/24 ° C	BS glass	80	Filtr. and weigh	Effect of dissolved oxygen	39
	BMP	Diesel, jet. decane	7, 14 day/43 ° C	BS glass	81	Filtr. and weigh	Effect of metal surface	39
	BMP	Diesel, jet. decane	28, 56, day/24 ° C	BS glass	82	Filtr. and weigh	Effect of water	39
	N cpds.	Diesel, jet. decane	0, 14, 28, 56 day/43 ° C	BS glass	83	Color		39
	DMP	Diesel fuel	7, 14, 28, 56, 80 day/43 ° C	BS glass	84	Filtr. and weigh		39
	N cpds	Diesel, jet. decane	14, 28, 56 day/43 ° C	BS glass	85	Filtr. and weigh		39
	N cpds.	Diesel fuel	0, 14, 28, 56 day/43 ° C	BS glass	86	Color		39
	N cpds.	Diesel fuel	28, 56, 112 day/43 ° C	BS glass	87	Filtr. and weigh		39
JET								
1956	Additives	Jet fuel	1, 3, 7 mo/43 ° C	Glass	88	D-381	Effect of copper on stability	79
	Additives	Jet fuel	2, 9 mo/43 ° C	Glass	89	D-381	Effect of soluble copper	79
	Additives	Jet fuel	1, 4, 7 wk/70 ° C	Glass	90	D-381	Effect of dispersants	79
1968	Jet fuel	None	0, 16, 35, 52 wk/130 ° F	Steel drum	91	JFTOT test	Effect of fuel system materials	57
1969	¹⁴ C Labeled opd.	Jet fuel	0, 26 wk/55 ° C	Amber glass	92	Radioactivity	Effect of additive on deposits	137
	¹⁴ C Labeled opd.	Jet fuel	0, 26 wk/55 ° C	Amber glass	93	Radioactivity	Effect of additive on deposits	137
	¹⁴ C Labeled opd.	Jet fuel	0, 26 wk/55 ° C	Amber glass	94	Radioactivity	Effect of additive on deposits	137
	¹⁴ C Labeled opd.	Jet fuel	0, 26 wk/55 ° C	Amber glass	95	Radioactivity	Effect of additive on deposits	137

1,2,5-Dimethylpyrrole

TABLE 1
Summary of Data Included in Subsequent Tables by Category -- continued

Date Published	Material Studied	Storage Media	Method of Accelerating Degradation	Container	Table No.	Quantitation Technique	Comments	Reference
JET (cont'd.)								
1969	¹⁴ C Labeled epd.	Jet fuel	0.26 wk/55 ° C	Amber glass	96	Radioactivity	Effect of additive on deposits	137
	¹⁴ C Labeled epd.	Jet fuel	0.26 wk/55 ° C	Amber glass	97	Radioactivity	Effect of additive on deposits	137
	¹⁴ C Labeled epd.	Jet fuel	0.26 wk/55 ° C	Amber glass	98	Radioactivity	Effect of additive on deposits	137
	¹⁴ C Labeled epd.	Jet fuel	0.26 wk/55 ° C	Amber glass	99	Radioactivity	Effect of additive on deposits	137
1970	Elastomers in fuel	Jet fuel	4.6, 8.12 mo/ambient	Collapse plastic	100	D-381, D-1661, D-524, D-2550		69
1971	containers	Jet fuel	52 wk/55 ° C	Amber glass	101	Vapor transfer/radioactivity		136
	¹⁴ C labeled epds	Jet fuel	52 wk/55 ° C	Amber glass	102	Vapor transfer/radioactivity		136
	¹⁴ C labeled epds	Jet fuel	52 wk/55 ° C	Amber glass	103	Vapor transfer/radioactivity		136
	¹⁴ C labeled epds	Jet fuel	52 wk/55 ° C	Amber glass	104	Vapor transfer/radioactivity		136
	¹⁴ C labeled epds	Jet fuel	52 wk/55 ° C	Amber glass	105	Vapor transfer/radioactivity		136
	¹⁴ C labeled epds	Jet fuel	52 wk/55 ° C	Amber glass	106	Vapor transfer/radioactivity		136
	¹⁴ C labeled epds	Jet fuel	52 wk/55 ° C	Amber glass	107	Vapor transfer/radioactivity		136
	¹⁴ C labeled epds	Jet fuel	52 wk/55 ° C	Amber glass	108	Vapor transfer/radioactivity		136
	¹⁴ C labeled epds	Jet fuel	52 wk/55 ° C	Amber glass	109	Vapor transfer/radioactivity		136
	¹⁴ C labeled epds	Jet fuel	52 wk/55 ° C	Amber glass	110	Vapor transfer/radioactivity		136
	¹⁴ C labeled epds	Jet fuel	52 wk/55 ° C	Amber glass	111	Ftr. and weigh		113
	H and O epds.	Jet fuel	26, 150 day/24 ° C	Glass	112	Ftr. and weigh; D-381	10 JP-4 samples studied	10
	Jet fuel	None	0.4, 8, 16, 32 wk/43 ° C	Amber glass	113	Weight	Sediment deposited on glass slip	29
	N epds	Jet fuel	144 hr/121 ° C	Soft glass	114	Weight	Sediment deposited on glass slip	142
1981	N epds	Jet fuel	168 hr/120 ° C	Soft glass	115	Weight	Sediment deposited on glass slip	50
1981	S epds	Jet fuel	7 day/135 ° C	Soft glass	116	Weight	Sediment deposited on glass slip	50
1981	S epds	Jet fuel	7 day/121 ° C	Soft glass	117	Weight	Sediment deposited on glass slip	50
1982	S epds	Jet fuel	7 day/121, 130 and 135 ° C	Soft glass	118	Weight	Sediment deposited on glass slip	39
	N epds and Vinyl olefins	Jet fuel	28 day/43 ° C	BS glass				
FUEL OIL								
1954	Fuel oil	None	0-14 wk/ambient	unknown	119	Microscopic exam.		118
1956	Fuel oil	None	5-1275 hr/43 ° C to 100 ° C	Glass	120	Ftr. and weigh		75
	Fuel oil	None	2-650 hr/65 ° C to 100 ° C	Glass	121	Ftr. and weigh		75
1957	S epds	Fuel oil	12 wk/43 ° C	Unknown	122	Ftr. and weigh		85
	N epds	Fuel oil	12 wk/43 ° C	Unknown	123	Ftr. and weigh		85
1957	Fuel oil	None	0-216 hr/82 ° C	BS glass	124	Ftr. and weigh, light abs.		5
1957	Fuel oil	None	0.8, 13, 26, 39 wk/43 ° F	Glass	125	Light transmission, ftr. and weigh, D-381		103
1958	Fuel oil	None	24hr/100 ° C vs 6 mo/30 ° C	Glass/steel	126	Ftr. and weigh		45
1958	Fuel oil	None	0-133 day/ambient	Unknown	127	Measured conc. of S cpd. and peroxide		95
	S epds	Fuel oil	24 hr/100 ° C	Glass	128	Ftr. and weigh, color	Comparison of soft and borosilicate glass	95
1958	Fuel oil	None	42 day/55 ° C	Glass	129	Ftr. and weigh	Comparison of soft and borosilicate glass	24
	Fuel oil	None	126 day/55 ° C	Glass	130	D-381	Comparison of soft and borosilicate glass	24
	Fuel oil	None	42, 80, 82 days/55 ° C	Glass	131	Light transmission, D-381	Comparison of soft and borosilicate glass	24

TABLE 1

Summary of Data Included in Subsequent Tables by Category -- continued

Date Published	Material Studied	Storage Media	Method of Accelerating Degradation	Container	Table No.	Quantification Technique	Comments	Reference
FUEL OIL (cont'd.)								
1968	Fuel oil	None	18 hr./99 ° C	Glass	132	Fhr. and weigh. D-381, light transmission	Comparison of soil and borosilicate glass	24
1969	Fuel oil	None	0-24 mo./ambient; 0-65 wk./43 ° F	Glass/steel	133	% Light transmission	12 fuels studied	27
	Fuel oil	None	0-24 mo./ambient; 0-65 wk./43 ° F	Glass/steel	134	Fhr. and weigh. Insoluble gum	12 fuels studied	27
	Fuel oil	None	0-24 mo./ambient; 0-65 wk./43 ° C	Glass/steel	135	D-381	12 fuels studied	27
1961	Polar fuel extract	Fuel oil	0.13, 26, 39 wk./43 ° C	Soft glass	136	Fhr. and weigh. D-381, peroxide no.		31
1967	Fuel oil	None	3.6, 9 mo./ambient	Glass/metal	137	Fhr. and weigh.		8
	Fuel oil	None	3.6, 9 mo./ambient	Glass/metal	138	Fhr. and weigh.		8
1973	Fuel oil	None	0.3, 6, 12, 18, 24, 30 mo./ambient	SS glass	139	Fhr. and weigh.		140
	Fuel oil	None	0.3, 6, 12, 18, 24, 30 mo./ambient	SS glass	140	Fhr. and weigh.		140
	Fuel oil	None	0.3, 6, 12, 18, 24, 30 mo./ambient	SS glass	141	Fhr. and weigh.		140
	Fuel oil	None	0.3, 6, 12, 18, 24, 30 mo./ambient	SS glass	142	Fhr. and weigh.		140
	Fuel oil	None	6, 12, 24 mo./ambient	Tin cans	143	Fhr. and weigh.		140
	Fuel oil	None	0.12, 24, 30 wk./43 ° C	SS glass	144	Fhr. and weigh.		140
SYNCRUDES								
1977	Iron and oxidation inhibitors	Jet fuel, coal derived	28 wk./43 ° C	Lined steel cans	145	JFTOT test		82
	Iron and oxidation inhibitors	Jet fuel, coal derived	28 wk./43 ° C	Lined steel cans	146	Fhr. and weigh.		82
1977	Coal liquids	None	0-35 day/61 ° C	Glass	147	Solvent analysis of oil		58
1979	Alternative fuels	None	18 hr./93 ° C	Glass	148	Fhr. and weigh. D-381	11 fuels studied	29
	Alternative fuels	None	0.4, 8, 16, 32 wk./43 ° C	Amber glass	149	Fhr. and weigh. D-381	11 fuels studied	20
1978	Coal liquids	None	30 day/90 ° C under O ₂ or N ₂	Unknown	150	Solvent analysis		35
	Coal liquids	None	30 day/90 ° C under O ₂ or N ₂	Unknown	151	ESH of asphaltenes		35
1980	Coal and shale liquids	None	4.8, 16, 32 wk./43 ° C	Amber glass	152	Fhr. and weigh. D-381		9
	Coal and shale liquids	None	0.4, 8, 16, 32 wk./43 ° C	Amber glass	153	Detr. O ₂ and peroxide no.		9
	Jet, diesel fuel, shale derived	None	32 wk./43 ° C	Glass	154	JFTOT test		9
1980	Coal derived liquids	None	0.28, 35 day/81 ° C	SS glass	155	Solvent analysis	aged with N ₂ , O ₂ or air	22
1981	N copds. and anti-oxidation additives	Jet fuel, shale derived	4 wk./80 ° C	SS glass	156	Fhr. and weigh. JFTOT		84
1981	SRC-II fuel oil, coal derived	None	5 mo./48 ° C	Unknown	157	Vis., Pour point, D-803		105
1982	Shale distillate	None	28, 60, 70, 84, 120, 156, day/43 ° C	SS glass	158	Fhr. and weigh.	High N shale liquid	39
	Shale distillate	None	28, 66, 120, 187 day/43 ° C	SS glass	159	Fhr. and weigh.	Low N shale liquid	38
	Shale liquid	None	28, 70, 120 day/43 ° C	SS glass	160	Fhr. and weigh.		39

TABLE 1
Summary of Data Included in Subsequent Tables by Category -- continued

Date Published	Material Studied	Storage Media	Method of Accepting Degradation	Container	Table No.	Quantification Technique	Comments	Reference
1982	SYNCRUDE (cont'd.)							
	DMP	Shale liquid	20,56,70,84,120 day/43 ° C	BS glass	161	Filtr. and weigh	Interaction studies	39
1982	DMP and Thiophanol	Shale liquid	28,56,84,120 day/43 ° C	BS glass	162	Filtr. and weigh	Interaction studies	39
	Coal/tar sand liquids	None	0,4,8,16,32 wk/43 ° C	BS glass	163	Filtr. and weigh, B-381		17
	Coal, tar sand liquids	None	0,4,8,16,32 wk/43 ° C	BS glass	164	Acid number and viscosity		17
	Coal, tar sand liquids	None	0,4,8,16,32 wk/43 ° C	BS glass	165	Detr. D-2 and paroxida no.		17
1983	Coal, tar sand liquids	Shale oil diesel	0,4,8,16,32 wk/43 ° C	BS glass	166	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	52 day/43 ° C	BS glass	167	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	92 day/43 ° C	BS glass	168	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	128 day/43 ° C	BS glass	169	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	176 day/43 ° C	BS glass	170	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	52 day/43 ° C	BS glass	171	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	4 day/80 ° C	BS glass	172	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	7 day/80 ° C	BS glass	173	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	14 day/80 ° C	BS glass	174	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	28 day/80 ° C	BS glass	175	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	4 day/77 ° C	BS glass	176	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	7 day/77 ° C	BS glass	177	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	14 day/80 ° C	BS glass	178	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	21 day/80 ° C	BS glass	179	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	28 day/80 ° C	BS glass	180	Filtr. and weigh	0 to 450 ppm N	47
	Shale oil diesel	None	21-28 day/80 ° C	BS glass	181	Filtr. and weigh	Fuel blank	47
	DMP	Shale oil diesel	11 day/65 ° C	BS glass	182	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	20 day/65 ° C	BS glass	183	Filtr. and weigh	0 to 450 ppm N	47
1983	DMP	Shale oil diesel	32 day/65 ° C	BS glass	184	Filtr. and weigh	0 to 450 ppm N	47
	DMP	Shale oil diesel	50 day/65 ° C	BS glass	185	Filtr. and weigh	Remn. of exp. reported in 184	47
	DMP	Shale oil diesel	50 day/65 ° C	BS glass	186	Filtr. and weigh	450 ppm N	47
	14 individual N cpds	Shale oil diesel	14 day/80 ° C	BS glass	187	Filtr. and weigh	450 ppm N	47
	14 individual N cpds	Shale oil diesel	14 day/80 ° C	BS glass	188	Filtr. and weigh	450 ppm N	47
	13 individual N cpds	Shale oil diesel	14 day/80 ° C	BS glass	189	Filtr. and weigh	450 ppm N	47
	7 individual N cpds	Shale oil diesel	80 day/43 ° C	BS glass	190	Filtr. and weigh	450 ppm for each N cpd.	47
	7 individual N cpds	Shale oil diesel	14 day/80 ° C	BS glass	191	Filtr. and weigh	450 ppm for each N cpd	47
	plus DMP	Shale oil diesel	14 day/80 ° C	BS glass	192	Filtr. and weigh	No N added	47
	plus DMP	Shale oil diesel	14 day/80 ° C	BS glass	193	Filtr. and weigh		47
	Shale oil fuel	None	0-14 day/80 ° C	BS glass	194	Filtr. and weigh and D-381	13	13
	Shale oil fuel	None	2,4,8,12,16,24 wk/43 ° C	BS glass	195	Via. det.	13	13
	Coal liquids	None	0,24, wk/43 ° C	BS glass	196	Filtr. and weigh and D-381	13	13
	Coal liquids	None	0,2,4,8,12,16,24 wk/43 ° C	BS glass	197	Filtr. and weigh	13	13
	Shale liquids	None	2,4,8,12,16,24 wk/43 ° C	BS glass	198	Heptane insolubles	13	13
	Shale liquids	None	0,2,4,8,12,16,24 wk/43 ° C	BS glass	199			

TABLE
Summary of Data Included in Subsequent Tables by Category -- continued

Date Published	Material Studied	Storage Media	Method of Accelerating Degradation	Container	Table No.	Quantification Technique	Comments	Reference
SYNCRIDES (cont'd.)								
1983	Shale liquids	None	0.24 wk/43 °C	BS glass	199	Vis. det.		13
	Experimental Fuel	None	4.8, 12, 16, 24 wk/43 °C	BS glass	200	Filtr. and weigh. and D-381		13
	Shale liquids	None	3.7, 14 day/80 °C	BS glass	201	Filtr. weigh		13
	Shale liquids	None	0.7, 14 day/80 °C	BS glass	202	Heptane Insolubles		13
PURE COMPOUNDS								
1959	S cpts: hydrocarbons	Cetane	14 day/43 °C	BS glass	203	Filtr. and weigh. S det.; color		88
	S cpts: hydrocarbons	Cetane	3 day/43 °C	BS glass	204	Filtr. and weigh. S det.; color		88
	S cpts: hydrocarbons	Cetane	4 wk/43 °C	BS glass	205	Filtr. and weigh. color det.		88
	S cpts: hydrocarbons	Cetane	5 wk/43 °C	BS glass	206	Filtr. and weigh. color det.		88
	S and N cpts	Pure hydrocarbons	6 wk/43 °C	BS glass	207	Filtr. and weigh. color det.		87
1963	N cpts and olefins	Cetane	4 wk/43 °C	BS glass	208	Filtr. and weigh. color det.		87
	Radioactive labeled n-Heptane	n-Heptane	0.8, 16, 32, 64 day/43 °C	Amber glass	209	Vapor transfer and weigh. D-381 and radioactivity		132
	Radioactive labeled n-Heptane	n-Heptane	0.8, 16, 32, 64 day/43 °C	Amber glass	210	Vapor transfer and weigh. D-381 and radioactivity		132
	Radioactive labeled n-Heptane	n-Heptane	0.8, 16, 32, 64 day/43 °C	Amber glass	211	Vapor transfer and weigh. D-381 and radioactivity		132
	S cpts. - hydrocarbon	n-Heptane	2-68 day/43 °C	Glass	212	O ₂ det.		100
1985	S cpts. - hydrocarbon	n-Heptane	32 day/43 °C	Glass	213	Vapor transfer and weigh		100
	Labeled thiophenol	n-Heptane	0.8, 15, 23, 32 day/43 °C	Glass	214	Vapor transfer and weigh. radioactivity		100
	Labeled tetralin and thiophenol	n-Heptane	0.4, 8, 15, 23, 32 day/43 °C	Glass	215	Vapor transfer and weigh. radioactivity		100
	Additives	Pure hydrocarbon	16 hr/43 °C to 93 °C	Glass	216	Filtr. and weigh. D-381		135
	Hydrocarbon + TEL	Isodecane	16 hr/93 °C	Glass	217	Filtr. and weigh. D-381, O ₂ det.		135
1977	Hydrocarbon + TEL	Isodecane	40 hr/82 °C	Glass	218	Filtr. and weigh. D-381, O ₂ det.	Effect of N cpts on gum formation	135
	10 individual N cpts	Decane	1.5, 20, 30, 60 day/uv	Glass	219	Filtr. and weigh		36
	N cpts. organic acids and phenols	Decane	light or darkness	Glass	220	Filtr. and weigh	Influence of organic acids	36
	N cpts and organic acids	Decane	light or darkness	Glass	221	Filtr. and weigh. elem. analysis	Analysis of sediment	36
	DMP	Decane	6, 60, 60 day/uv	Glass	222	Filtr. and weigh	Storage in light and dark	37
1979	N cpts	Decane	light or darkness	Glass	223	Filtr. and weigh	Storage in light and dark	37
	N cpts	Decane	1.5, 15, 30, 60 day/24 °C	Glass	224	Filtr. and weigh	Storage in light and dark	37
	N cpts	Decane	1.5, 15, 30, 60 day/24 °C	Glass	225	Filtr. and weigh	Storage in light and dark	37
	N cpts + hydrocarbons	Decane	1.5, 15, 30, 60 day/24 °C	Glass	226	Filtr. and weigh	Storage in light and dark	37
	DMP + carboxylic acids	Decane	1.5, 15, 30, 60 day/24 °C	Glass	227	Filtr. and weigh	Storage in light and dark	37

TABLE 1
Summary of Data Included in Subsequent Tables by Category -- continued

Date Published	Material Studied	Storage Media	Method of Accelerating Degradation	Container	Table No.	Quantification Technique	Comments	Reference
PURE COMPOUNDS (cont'd.)								
1979	DMP + S cpds	Decane	1.5,15,30,60 day/24 ° C	Glass	228	Filtr. and weigh		37
	DMP + oxygen	Decane	1.5,15,30,60 day/24 ° C	Glass	229	Filtr. and weigh	Effects of deoxygenation	37
	N cpds, H ₂ O, H ₂ SO ₄	Decane	1.5,15,30,60 day/24 ° C	Glass	230	Filtr. and weigh		37
1983	DMP	Solvents	4 day/80 ° C	BS glass	231	Filtr. and weigh	450 ppm N	47

TABLE 2
Storage Data for Very Stable Gasoline

Property or test	Clear Weeks storage at 43.3 °C (110 ° F)											
	0		4		8		12		16		20	
	A	B	A	B	A	B	A	B	A	B	A	B
Gum analyses												
Insoluble gum, mg/100 ml.	0.3	0.3	0.1	0.0	0.4	0.4	0.1	0.2	0.0	0.0	0.3	0.5
Air jet gum, mg/100 ml.	1.1	1.1	2.1	1.7	1.7	.8	2.6	1.7	1.8	1.7	2.3	2.3
Vacuum evaporation gum, mg/100 ml.	4.5	--	7.4	--	5.4	--	4.8	--	7.5	--	7.8	--
Adherent gum, mg/100 ml.	--	--	--	--	--	--	--	--	--	--	--	--
% Light Transmission	98.2	98.2	98.3	98.2	97.8	97.9	98.1	98.1	97.7	97.7	97.7	97.7
Specific gravity 60/60 ° F	.7780	.7790	.7821	.7820	.7819	.7833	.7818	.7817	.7821	.7821	.7816	.7821
Diolefin	.1	.1	--	0.0	--	.1	--	0.0	--	.1	--	0.0
Vol. % O ₂ Content of storage atmosphere	19.5	19.5	19.7	19.1	19.3	18.7	18.6	18.8	18.4	19.6	17.4	18.9
Hydroperoxide no.	.38	.38	--	0.0	--	.20	--	.32	--	.32	--	.38

Leaded (3.0cc TEL/gal.)

Gum analyses												
Insoluble gum, mg/100 ml.	0.0	0.0	0.2	0.3	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.0
Residue, mg./100 ml.	.0	.0	.0	0.4	--	--	.0	.0	.0	.0	.0	.0
Air jet gum, mg/100 ml.	1.1	1.1	1.1	3.8	.3	.7	1.3	1.2	2.0	2.2	1.3	1.6
Vacuum evaporation gum, mg/100 ml.	3.6	3.6	5.6	--	3.4	--	19.3	--	8.9	--	11.1	--
Adherent gum, mg/100 ml.	--	--	--	--	--	--	--	--	--	--	--	--
% Light transmission	96.5	96.5	96.6	96.6	95.4	96.4	96.4	96.4	96.3	96.3	96.3	96.2
Specific gravity 60/60 ° F	.7804	.7809	.7809	.7809	.7810	.7820	.7823	.7828	.7802	.7828	.7789	.7805
Diolefin	--	--	.0	.0	--	.1	--	.0	--	.0	--	.0
Vol. % O ₂ content of storage atmosphere	19.5	17.8	17.5	.08	18.3	18.8	9.1	11.9	16.1	15.3	13.7	14.7
Hydroperoxide no.	.01	--	--	--	.09	.09	--	.24	--	.28	--	.71

Table 2 continued on next page

Taken from Reference No. 121, 122, and 105

TABLE 2 --continued
Storage Data for Very Unstable Gasoline

Property or test	Clear Weeks storage at 43.3 °C (110 ° F)											
	0		4		8		12		16		20	
	A	B	A	B	A	B	A	B	A	B	A	B
Gum analyses												
Insoluble gum, mg/100 ml.	0.4	0.4	0.2	0.2	0.1	0.3	0.4	0.6	0.5	0.9	0.8	1.2
Air jet gum, mg/100 ml.	9.2	9.2	14.3	14.6	15.7	16.5	19.8	21.5	18.6	22.9	20.2	22.3
Vacuum evaporation gum, mg/100 ml.	16.5	--	21.4	--	18.9	--	24.4	--	43.3	--	39.6	--
Adherent gum, mg/100 ml.	--	--	--	--	.4	.4	--	--	1.3	2.4	--	--
% Light Transmission	91.9	91.9	83.9	80.2	86.0	84.8	78.4	78.4	75.9	76.2	74.4	74.4
Specific gravity 60/60 ° F	.7810	.7810	.7849	.7881	.7871	.7891	.7873	.7889	.7882	.7889	.7897	.7948
Diolefin	--	.7	--	0.6	--	.6	--	0.6	--	.6	--	0.6
Vol. % O ₂ Content of storage atmosphere	16.9	16.9	12.8	13.5	17.3	16.8	15.8	14.0	18.1	17.4	12.0	14.0
Hydroperoxide no.	--	.05	--	.08	--	.06	--	nil	--	.08	--	.14

82

Leaded (3.0cc TEL/gal.)

Gum analyses												
Insoluble gum, mg/100 ml.	0.0		0.2	0.0	0.2	0.0	0.6	0.9	0.2	0.4	0.3	0.2
Residue, mg/100 ml.	.0		0.1	.0	.1	.1	8.5	1.8	11.3	3.6	15.3	6.2
Air jet gum, mg/100 ml.	11.2		21.9	20.1	28.8	16.0	38.9	19.4	52.7	30.0	56.0	33.3
Vacuum evaporation gum, mg/100 ml.	--		32.6	--	35.4	--	81.9	--	86.3	--	116.2	--
Adherent gum, mg/100 ml.	--		--	--	--	--	--	--	--	--	--	--
% Light transmission	90.6		81.5	83.4	86.7	78.6	89.6	77.1	87.7	82.5	87.5	85.6
Specific gravity 60/60 ° F	.7768		.7804	.7819	.7808	.7818	.7816	.7820	.7832	.7845	.7829	.7829
Diolefin	--	.5	--	.5	--	.6	--	.4	--	.5	--	.5
Vol. % O ₂ content of storage atmosphere	16.9		9.4	12.9	9.2	11.6	5.5	7.7	9.3	10.2	7.7	7.9
Hydroperoxide no.	--	.0	--	.0	--	.0	--	.22	--	1.29	--	2.38

Table 2 continued on next page

Taken from Reference No. 121, 122, and 105

TABLE 2 continued
Storage Data for Moderately Stable Gasoline

Property or test	Clear Weeks storage at 43.3 °C (110 ° F)											
	0		4		8		12		16		20	
	A	B	A	B	A	B	A	B	A	B	A	B
Gum analyses												
Insoluble gum, mg/100 ml.	0.1	0.1	0.3	0.5	0.2	0.4	0.4	0.8	0.1	0.0	0.1	0.1
Air jet gum, mg/100 ml.	.8	.8	1.4	.9	.4	.8	.8	1.0	1.2	.8	1.2	0.6
Vacuum evaporation gum, mg/100 ml.	1.6	--	.7	--	2.3	4.8	4.8	--	6.2	--	4.6	--
Adherent gum, mg/100 ml.	--	--	--	--	--	--	--	--	--	--	--	--
% Light Transmission	99.0	99.0	99.7	99.7	99.7	99.6	99.6	99.6	99.7	99.7	99.7	99.6
Specific gravity 60/60 ° F	.7776	.7776	.7779	.7789	.7788	.7775	.7775	.7808	.7819	.7788	.7809	.7783
Diolefin	.1	.1	--	0.1	--	--	--	0.0	--	.0	--	.0
Vol. % O ₂ Content of storage atmosphere			17.1	17.8	16.5	17.0	17.9	18.8	18.9	18.3	17.7	17.2
Hydroperoxide no.		.19		.40		.65		.95		1.31		1.80
Leaded (3.0cc TEL/gal.)												
Gum analyses												
Insoluble gum, mg/100 ml.	0.0		0.5	0.1	0.3	0.2	0.0	0.2	0.2	0.2	0.0	0.1
Residue, mg./100 ml.	.0		0.4	.1	.3	.3	.0	.3	.1	.0	.1	.0
Air jet gum, mg/100 ml.	.5		.7	1.2	1.3	2.8	2.2	1.8	2.5	2.4	3.7	3.0
Vacuum evaporation gum, mg/100 ml.	3.6		3.0		2.1	--	11.3	--	6.2	--	24.0	--
Adherent gum, mg/100 ml.	--		--	--	--	--	--	--	--	--	--	--
% Light Transmission	97.4		97.6	97.6	97.5	97.5	97.3	97.3	97.2	97.2	97.3	97.3
Specific gravity 60/60 ° F	.7768		.7809	.7792	.7810	.7810	.7778	.7802	.7803	.7813	.7785	.7789
Diolefin	.0			.0		.1		.0		.0		.0
Vol. % O ₂ content of storage atmosphere			16.7	18.5	18.1	17.9	15.9	17.0	16.1	17.5	16.4	17.0
Hydroperoxide no.		.0		.82		1.07		1.0		1.35		1.50

Taken from Reference No. 121, 122, and 105

TABLE 3
Storage Stability Test Data of Gasolines at 43.3 °C (110 °F)

Sample	0 Weeks Storage			20 Weeks Storage ¹			
	Air-Jet Gum	Hydro- peroxide	Color	Gum mg/100 ml		Hydro- peroxide	Color
	mg/100 ml.	Number		Insoluble	Air-Jet	Number	
1-Regular Gasoline	1.9	0.09	97.0	8.6	141.2	12.7	96.4
1-Depolarized	127.0	NII	98.9	32.0	331.3	13.0	98.0
2-Regular Gasoline	1.0	NII	97.0	.4	2.8	.10	88.1
2-Depolarized	60.9	NII	99.7	1.2	144.7	19.9	99.3
3-Regular Gasoline	1.8	.11	98.1	.2	3.9	.3	98.1
3-Depolarized	8.0	NII	98.4	.1	11.5	1.0	98.5
4-Premium Gasoline	4.2	.25	52.1	2.1	54.4	13.7	56.4
4-Depolarized	36.0	NII	99.7	1.5	142.9	23.8	99.5
5-Regular Gasoline	.4	NII	99.1	.1	1.2	.4	99.5
5-Depolarized	2.3	NII	100.0	.1	2.1	4.4	100.0
6-Cat. Cr. Gasoline	1.8	NII	65.0	1.9	6.3	.3	41.5
6-Depolarized	194.6	.64	99.8	.7	435.8	16.5	96.9
7-Regular Gasoline	1.5	NII	98.3	.5	3.7	.8	92.0
7-Depolarized	62.5	NII	98.7	18.6	223.3	4.0	95.4
8-Premium Gasoline	1.4	.04	90.9	.1	2.1	.6	86.2
8-Depolarized	44.4	.09	99.2	4.1	156.7	5.0	97.1
9-Regular Gasoline	1.7	.08	98.0	.5	5.2	3.6	96.7
9-Depolarized	75.4	.30	98.6	2.1	234.4	21.3	98.0
10-Regular Gasoline	1.7	.03	98.8	.3	3.2	1.1	96.7
10-Depolarized	35.7	.04	99.3	5.8	208.7	14.2	98.0
11-Regular Gasoline	8.9	1.49	98.2	1.2	82.9	19.2	98.0
11-Depolarized	76.4	.60	97.9	2.1	184.4	13.3	98.3
12-Regular Gasoline	4.8	.51	97.2	4.3	63.8	13.6	96.4
12-Depolarized	58.4	NII	98.8	2.6	202.3	16.0	98.3
13-Regular Gasoline	2.0	.01	98.2	2.2	71.2	40.0	96.8
13-Depolarized	55.3	.10	99.0	1.5	151.6	10.2	97.0
14-Regular Gasoline	1.9	.18	98.3	.5	7.1	1.9	97.8
14-Depolarized	25.9	.08	99.7	.7	126.6	14.7	98.7
15-Cat. Cr. Gasoline	2.7	.20	99.6	.8	9.5	14.2	98.1
15-Depolarized	31.5	.16	99.7	.2	160.7	101.6	99.8
16-Cat. Poly. Gasoline	6.7	.24	86.0	.2	22.2	58.0	89.0
16-Depolarized	4.7	.17	97.4	.2	61.3	52.2	97.6
Platformate	1.6	.07	98.0	.2	1.9	0.0	97.5
Depolarized	15.3	.08	98.4	.3	36.9	.8	97.9
Cat. Cr. Gasoline	7.4	NII	98.2	2.8	30.4	.01	73.3
Depolarized	64.0	.19	99.0	38.4	1359.9	30.6	95.2
Cat. Cr. Gasoline, Hydrogenated	NII	.15	99.5	.2	NII	2.3	99.4
Depolarized	4.2	.15	99.9	.3	46.0	33.2	99.7
Therm. Cr. Gasoline	1.2	.04	99.7	2.5	21.5	4.9	97.7
Depolarized	12.1	.19	99.8	.4	157.9	28.1	99.2

¹Stored in 1-quart bottles Air/sample ratio 1:1

Taken from Reference No. 122, and 105

TABLE 4
Stability Tests of Motor Gasolines

Sample ¹	0 Weeks Storage					20 Weeks Storage at 43.3 °C (110 °F)				
	Air-jet Gum mg./100 ml.		Hydro- peroxide No.	Light Transmission, %	Copper Dish Gum mg./100 ml	Insoluble Gum mg./100 ml	Air-jet Gum mg./100 ml.		Hydro- peroxide No.	Light Transmission, %
	Total	Heptane Insoluble					Total	Heptane Insoluble		
17	3.2	2.9	.49	99.3	169.2	75.5	263.4	248.9	5.4	74.3
18	12.1	Nil	.09	99.7	25.7	2.3	41.6	19.5	3.1	94.5
19	5.3	.1	.08	99.6	22.5	0.7	52.8	48.8	35.9	98.1
20	2.6	.3	.22	99.7	24.7	1.6	39.8	37.6	39.8	99.3
21	5.0	.3	.04	100.0	12.5	1.6	36.2	34.0	15.0	98.6
22	2.1	.4	.32	99.7	11.1	1.4	7.9	5.4	3.5	91.8
23	6.8	4.8	.18	99.6	125.2	5.6	159.8	149.9	32.6	95.7
24	1.0	.6	.17	99.8	6.4	1.1	8.9	7.5	10.5	98.1
25	.8	.5	.04	99.6	6.2	2.0	16.1	16.0	12.2	97.1
26 ²	56.0	1.3	.59	90.5	213.8	2.2	99.5	27.6	14.2	90.9
27 ²	61.7	1.3	.26	92.9	343.7	3.8	155.5	25.8	20.8	94.5

¹Motor gasolines, uninhibited

²Contains TEL + inhibitor

Taken from Reference No. 124

TABLE 5

Gum Formed by Ultraviolet Irradiation of Very Unstable Gasoline

Irradiation Time, Hrs.	Wt. Fuel, grams	Total grams	Gum wt. % of fuel	Heptane-soluble gum			Heptane-insoluble gum		
				% Total Gum	Grams	Wt. % Fuel	% Total Gum	Grams	Wt. % Fuel
							Cumulative wt. % Fuel		Cumulative wt. % Fuel
2	383.3	1.00	0.262	93.2	0.932	0.243	---	0.068	0.018
6	384.7	1.07	278	60.4	546	.168	---	.424	.110
12	385.9	2.19	567	60.1	1.316	.341	---	.874	.226
18	383.6	3.48	900	62.5	2.163	.563	---	1.297	.337
24	386.5	3.10	.805	39.0	1.289	.315	---	1.891	.490
Irradiation for Aromatic Analysis									
24	464	3.29	0.709	58	1.908	0.411	0.411	1.382	0.298
72	434	12.10	2.788	78	9.438	2.174	2.585	2.562	.613
120	410	22.27	5.432	85	18.930	4.617	7.202	3.341	.815
									1.726

Taken from Reference No. 125

TABLE 6

Sulfur Depletion in Very Unstable Gasoline in 24 Hours of UV Irradiation

Compound	Fresh		Aged	
	Very Unstable Gasoline		Very Unstable Gasoline	
Total sulfur, wt. %	0.094		0.075	
H ₂ S sulfur, wt. %	.003		.000	
Elemental sulfur, wt. %	.0005		.0002	
Mercaptan sulfur, wt. %	.0052		.0021	
Disulfide sulfur, wt. %	.0042		.0009	
Sulfide sulfur, wt. %	.036		.027	
Thiophenes) sulfur, wt. %	.0451		.0451	
Residual)				
Thiophenols, wt. %	.003		.008	

* By difference.

Taken from Reference No. 125 and 105

TABLE 7
Depletion of Sulfur Compounds in Very Unstable Gasoline by Aging

Irradiation Time, hrs.	Fresh Fuel			Aged Fuel			Depletion S	
	Grams	% S	Grams S	Grams	% S	Grams S	Grams	%
H₂S								
2	383.3	0.003	0.011	377.2	0.000	0	0.011	100
6	384.7	.003	.011	352.6	.0	0	.011	100
12	385.9	.003	.011	367.4	.0	0	.011	100
18	383.6	.003	.011	360.8	.0	0	.011	100
24	386.5	.003	.011	367.8	.0	0	.011	100
Elemental S								
2	383.3	0.0004	0.0015	377.2	0.0001	0.0004	0.0011	73.3
6	384.7	.0004	.0015	352.6	.0001	.0004	.0011	73.3
12	385.9	.0004	.0015	367.4	.0001	.0004	.0011	73.3
18	383.6	.0004	.0015	360.8	.0001	.0004	.0011	73.3
24	386.5	.0004	.0015	367.8	.0001	.0004	.0011	73.3
Mercaptans								
2	383.3	0.0052	0.0199	377.2	0.0051	0.0192	0.0007	3.5
6	384.7	.0052	.0200	352.6	.0049	.0173	.0027	13.5
12	385.9	.0052	.0201	367.4	.0040	.0147	.0054	26.9
18	383.6	.0052	.0199	360.8	.0030	.0108	.0091	45.7
24	386.5	.0052	.0201	367.8	.0021	.0077	.0124	61.7
Sulfides								
2	383.3	0.047	0.1802	377.2	0.041	0.1547	0.0255	14.2
6	384.7	.047	.1808	352.6	.034	.1202	.0806	33.5
12	385.9	.047	.1814	367.4	.031	.1139	.0675	37.2
18	383.6	.047	.1803	360.8	.029	.1046	.0757	42.0
24	386.5	.047	.1817	367.8	.028	.1030	.0787	43.3
Disulfides								
2	383.3	0.0032	0.0123	377.2	0.0012	0.0045	0.0078	63.4
6	384.7	.0032	.0123	352.6	.0013	.0046	.0077	62.6
12	385.9	.0032	.0123	367.4	.0010	.0037	.0086	69.9
18	383.6	.0032	.0123	360.8	.0009	.0032	.0091	74.0
24	386.5	.0032	.0124	367.8	.0009	.0033	.0091	73.4
Total Sulfur								
2	383.3	0.094	0.3604	377.2	0.086	0.3244	0.0359	10.0
6	384.7	.094	.3616	352.6	.087	.3088	.0548	15.2
12	385.9	.094	.3627	367.4	.080	.2939	.0588	19.0
18	383.6	.094	.3606	360.8	.077	.2778	.0828	23.0
24	386.5	.094	.3633	367.8	.076	.2759	.0874	24.0

aken from Reference No. 125 and 105

TABLE 8

Depletion of Indigenous Nitrogen Compounds
in Very Unstable Gasoline by 24 Hours Ultraviolet Irradiation

Compound	Fresh Fuel	Aged Fuel	% Reacted
Nitrogen			
Total nitrogen, wt. %	0.0043	0.0007	84
Basic nitrogen, wt. %	.0039	.0007	82
Pyrrrole nitrogen, wt. %	.0006	.0004	33
Residual nitrogen, wt. % ¹	.0003	—	100

¹By difference.

Taken from Reference No. 125 and 105

88

TABLE 9

Nitrogen Depletion in Very Unstable Gasoline by Staged UV Irradiation.

Irradiation Time, hrs.	Fresh Fuel			Aged Fuel			N Depletion		
	Grams Sample	% N	Grams N	Grams Sample	% N	Grams N	Grams	%	
2	383.3	0.0043	0.0165	377.2	0.0037	0.0140	0.0025	15.2	
6	384.7	.0043	.0165	352.5	.0028	.0099	.0066	40.0	
12	385.9	.0043	.0166	367.4	.0012	.0044	.0122	73.5	
18	383.6	.0043	.0165	360.8	.0008	.0029	.0136	82.4	
24	386.5	.0043	.0166	367.8	.0007	.0026	.0140	84.3	

Taken from Reference No. 125 and 105

TABLE 10

Gum, Activity, and Toluene Distribution in Stored Sample of Very Unstable Gasoline Containing Labeled Toluene

Property	Storage Time, Weeks at 43.3 °C (110 °F)			
	0	8	16	24
Gum, mg / 100 ml				
Air Jet	5.0	7.4	6.0	13.6
Vapor Transfer	40.0	42.0	84.0	124.0
Activity, mc / 100 ml				
Whole Fuel	7.14	6.77	7.14	
Vapor Transfer Distillate	7.14	7.14	6.91	
Vapor Transfer Gum	NII	NII	NII	
Distribution of Toluene, % ¹				
Vapor Transfer Distillate	100.00	100.00	100.00	
Vapor Transfer Gum	NII	NII	NII	

¹ Calculated on basis of the activity of products from vapor transfer.

Taken from Reference No. 126

TABLE 11

Gum, Activity, and 1,3,5-Trimethylbenzene Distribution in Stored Sample of Very Unstable Gasoline Containing Labeled 1,3,5-Trimethylbenzene

Property	Storage Time, Weeks at 43.3 °C (110 °F)			
	0	8	16	24
Gum, mg / 100 ml				
Air Jet	4.2	10.3	10.0	
Vapor Transfer	64.0	60.0	70.0	
Activity, mc / 100 ml				
Whole Fuel	75.00	73.64	75.00	
Vapor Transfer Distillate	71.36	71.82	79.09	
Vapor Transfer Gum	.12	.26	.36	
Distribution of 1,3,5-Trimethylbenzene, % ¹				
Vapor Transfer Distillate	99.83	99.64	99.55	
Vapor Transfer Gum	.17	.36	.45	

¹ Calculated on basis of the activity of products from vapor transfer.

Taken from Reference No. 126

TABLE 12
Gum, Activity, and Indan Distribution in Stored Sample of Very Unstable Gasoline Containing Labeled Indan

Property	Storage Time, Weeks at 43.3 °C (110 °F)			
	0	8	16	24
Gum, mg / 100 ml				
Air Jet	4.2	8.7	13.5	
Vapor Transfer	53.0	52.0	73.0	
Activity, mc / 100 ml				
Whole Fuel	11.09	10.96	11.18	
Vapor Transfer Distillate	10.64	10.91	9.82	
Vapor Transfer Gum	.04	.06	.12	
Distribution of Indan, % ¹				
Vapor Transfer Distillate	99.63	99.45	98.79	
Vapor Transfer Gum	.37	.55	1.20	

¹ Calculated on basis of the activity of products from vapor transfer.

Taken from Reference No. 126

TABLE 13
Gum, Activity, and Thiophenol Distribution in Stored Sample of Very Unstable Gasoline Containing Labeled Thiophenol

Property	Storage Time, Weeks at 43.3 °C (110 °F)			
	0 ¹	8	16	24
Gum, mg / 100 ml				
Air Jet	3.2	10.8	9.9	
Vapor Transfer	33.0	60.0	66.0	
Activity, mc / 100 ml				
Whole Fuel	9.64	16.64	15.23	
Vapor Transfer Distillate	9.55	12.23	10.27	
Vapor Transfer Gum	.36	4.25	4.89	
Distribution of Thiophenol, % ²				
Vapor Transfer Distillate	96.46	74.21	67.74	
Vapor Transfer Gum	3.54	25.79	32.26	

¹ Separate sample.

² Calculated on basis of the activity of products from vapor transfer.

Taken from Reference No. 126

TABLE 14
Gum Formation in Tagged Samples of Very Unstable Gasoline
in 43.3 °C (110 °F) Storage

Type of gum	Gum Formed During Indicated Storage Period, mg/100 ml			
	Weeks Storage at 43.3 °C (110 ° F)			
	0	8	16	24
Air jet gum	3	11	16	17
Vacuum transfer gum (total)	30	70	95	101
Vacuum transfer gum (insoluble)	1.5	15	28	35
Vacuum transfer gum (soluble)	29	51	67	66

Taken from Reference No. 127

TABLE 15
Storage Stability Data Of Unstable Gasoline With Various Tritium-Labeled Compounds Added

Labeled compound added	Storage at 43.3 ° C (110 ° F)					
	0 week		8 weeks		16 weeks	
	Percent reacted ¹	Vapor transfer gum, mg/100 ml	Percent reacted ¹	Vapor transfer gum, mg/100 ml	Percent reacted ¹	Vapor transfer gum, mg/100 ml
Saturates:						
n-Heptane	0.00	25	0.00	83	0.00	84
Isooctane	.00	44	.16	79	.16	65
Olefins:						
3-Heptene	.00	43	.05	75	.03	89
1-Hexene	.32	41	.35	75	.30	75
Cyclohexene	.25	35	-	-	.61	93
Aromatic olefins:						
Indene	.00	20	.27	80	.44	72
1-Phenyl-2-butene	.10	23	.33	78	.44	73
a-Methylstyrene	.17	35	.49	75	.52	76
Diolefins:						
2,5-Dimethyl-2,4-hexadiene	.13	30	.47	83	.55	69
2,5-Dimethyl-1,5-hexadiene	.10	32	-	-	.16	83
4-Vinylcyclo-1-hexene	.00	31	.05	74	.05	87
Substituted benzenes:						
Toluene	.00	40	.00	51	.00	84
1,3,5-Trimethylbenzene	.17	64	.36	60	.47	70
1,2,4,5-Tetramethylbenzene	.02	44	.10	66	.27	111
t-Butylbenzene	.01	39	.10	76	.14	95
C ₉ Blend	.02	30	-	-	.12	90
C ₁₀ Blend	.14	42	-	-	.44	101
Isopropylbenzene	.03	43	.33	81	.42	80
sec-Butylbenzene	.02	34	.20	72	.22	89
Polycyclic compounds:						
Indan	.00	53	.04	52	.05	73
1-Methylnaphthalene	.01	45	.14	57	.30	111
2,7-Dimethylnaphthalene	.04	35	.22	64	.43	91
2-Methylnaphthalene	.01	37	.17	75	.07	70
1,3-Dimethylindan	.03	29	.33	64	.77	103
Naphthalene blend	.05	41	-	-	.16	84
Sulfur compounds:						
Thiophenol	18.86	41	83.03	78	72.24	71
m-Toluenethiol	19.64	43	88.77	75	83.46	82
Cyclohexanethiol	.26	45	4.11	53	16.73	88
n-Butyldisulfide	.11	131	1.32	52	3.45	87
n-Butylsulfide	.25	88	5.06	67	5.28	84
Benzothioephene	.00	43	.06	70	.13	98
Isobutylthiophene	.00	40	.21	68	.25	82
Sulfide blend	.18	35	2.00	84	5.41	89
Disulfide blend	.49	34	1.11	89	1.22	73
Thiophene blend	.02	37	.06	80	.07	67
Nitrogen compounds:						
Aniline	.64	53	7.74	57	26.41	114
2,4,6-Trimethylpyridine	.03	54	.30	44	13.79	99
N-Methylpyrrole	.07	38	.27	84	.38	75
Quinoline	.07	54	.21	53	.34	75
Basic N blend	.37	40	4.85	83	6.88	77
Nonbasic N blend	.22	38	1.83	53	2.83	94
2-Methylpyridine	.00	37	.02	72	.12	79
Oxygen compounds:						
Phenol	.03	31	.22	37	.93	92
t-Butylhydroperoxide	.34	46	-	-	.34	100

¹On basis of vapor transfer gum only.