Chemical Name ; 1,4-Dioxane

Synonym ; Dietylene dioxide
p-Dioxane
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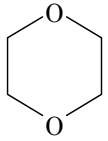
Molecular Weight ; 88.11
Melting Point ; 11.8℃[Aldrich]
Boiling Point ; 101.1℃[Merck]
Flashing Point ; 12 ℃[Aldrich]
Molecular Formular ; $C_4H_8O_2$

Chemical Structure



CAS No. ; 123-91-1
MITI No. ; (5)-839
ML No. ; －
Specified Chemical Substances ; －

Source of Substance ; Doujin Kgaku Kenkyusyo Co., Ltd.
Lot No. ; YM240
Purity ; 99%

Vehicle(Preincubation); H_2O

Vehicle(Gas Exposure); Filtrated Air
Exposure Condition ; 37℃, 24hr
Culture Condition ; 37℃, 24hr

Mutagenicity in Bacterial Test ; Negative

IARC Evaluation ; Group 2B

Conc. μg/plate	Number of Revertants/plate								
	Base-substitution								
	TA100			TA1535			WP2*uvr*A		
H_2O	S9－	RatS9+ /10%	Hamster S9+/10%	S9－	RatS9+ /10%	Hamster S9+/10%	S9－	RatS9+ /10%	Hamster S9+/10%
	(99)	(122)	(143)	(7)	(11)	(8)	(30)	(35)	(34)
	93	149	126	5	9	7	26	46	31
	105	138	126	7	8	18	31	43	46
12 .2	(99)	(144)	(126)	(6)	(9)	(13)	(29)	(45)	(39)
	115	128	126	11	10	11	29	40	36
	114	104	145	6	10	9	44	36	34
48 .8	(115)	(116)	(136)	(9)	(10)	(10)	(37)	(38)	(35)
	112	122	174	8	10	11	24	39	41
	109	148	152	9	9	15	34	33	29
195	(111)	(135)	(163)	(9)	(10)	(13)	(29)	(36)	(35)
	120	152	122	11	10	5	26	32	40
	102	130	152	11	15	9	34	38	40
781	(111)	(141)	(137)	(11)	(13)	(7)	(30)	(35)	(40)
	126	156	190	9	10	13	20	48	49
	122	130	162	6	11	6	30	43	41
3125	(124)	(143)	(176)	(8)	(11)	(10)	(25)	(46)	(45)
	107	162	156	6	9	6	33	32	33
	128	120	150	15	3	15	29	33	33
12500	(118)	(141)	(153)	(11)	(6)	(11)	(31)	(33)	(33)
	124 *	119	146	10 *	9	5	31	40	31
	119 *	144	152	0 *	13	13	40	36	33
50000 [a)]	(122 *)	(132)	(149)	(5 *)	(11)	(9)	(36)	(38)	(32)
Judgement	－	－	－	－	－	－	－	－	－
Specific Mutagenicity									
Positive Control	AF-2 (783)	2-AA (1298)	2-AA (3768)	NaN_3 (300)	2-AA (301)	2-AA (460)	AF-2 (362)	2-AA (1112)	2-AA (1388)

* Growth inhibitation was observed.
a)Undiluted 1,4-Dioxane 50 μl was used.

Experimental Data-1

Conc. μg/plate	Number of Revertants/plate					
	Frame-shift					
	TA98			TA1537		
H_2O	S9−	RatS9+ /10%	Hamster S9+/10%	S9−	RatS9+ /10%	Hamster S9+/10%
	(12)	(22)	(20)	(6)	(8)	(7)
	11	20	22	3	3	5
	9	23	17	3	9	8
12 .2	(10)	(22)	(20)	(3)	(6)	(7)
	8	17	22	5	10	15
	13	20	25	7	10	6
48 .8	(11)	(19)	(24)	(6)	(10)	(11)
	9	14	21	3	7	6
	16	22	23	7	10	6
195	(13)	(18)	(22)	(5)	(9)	(6)
	13	22	11	9	6	5
	18	16	26	13	6	10
781	(16)	(19)	(19)	(11)	(6)	(8)
	13	26	18	5	3	7
	10	15	22	9	8	7
3125	(12)	(21)	(20)	(7)	(6)	(7)
	17	20	17	8	8	7
	18	21	22	6	6	5
12500	(18)	(21)	(20)	(7)	(7)	(6)
	16 *	20	18	13 *	7	14
	16 *	18	32	6 *	13	5
50000 [a)]	(16 *)	(19)	(25)	(10 *)	(10)	(10)
Judgement	−	−	−	−	−	−
Specific Mutagenicity						
Positive Control	AF-2 (276)	2-AA (308)	2-AA (1055)	9-AA (701)	2-AA (210)	2-AA (880)

a)Undiluted 1,4-Dioxane 50 μl was used.

Conc. μg/plate	Number of Revertants/plate														
	Base-substitution														
	TA100					TA1535					WP2uvrA				
H_2O	S9−	RatS9+/ 10%	RatS9+/ 30%	Hamster S9+/10%	Hamster S9+/30%	S9−	RatS9+/ 10%	RatS9+/ 30%	Hamster S9+/10%	Hamster S9+/30%	S9−	RatS9+/ 10%	RatS9+/ 30%	Hamster S9+/10%	Hamster S9+/30%
	(104)	(127)	(120)	(137)	(162)	(6)	(5)	(10)	(11)	(9)	(15)	(26)	(29)	(24)	(16)
	139	151	139	153	180	8	7	9	7	16	25	37	33	15	17
	121	152	159	157	176	7	9	9	15	7	21	15	34	25	23
195	(130)	(152)	(149)	(155)	(178)	(8)	(8)	(9)	(11)	(12)	(23)	(26)	(34)	(20)	(20)
	119	163	130	144	166	10	9	15	8	13	15	17	26	24	13
	127	157	143	123	149	6	6	15	14	7	30	28	26	17	25
391	(123)	(160)	(137)	(134)	(158)	(8)	(8)	(15)	(11)	(10)	(23)	(23)	(26)	(21)	(19)
	99	129	137	141	149	7	5	5	10	11	18	17	23	23	18
	112	130	128	127	171	8	7	14	9	14	20	25	20	17	14
781	(106)	(130)	(133)	(134)	(160)	(8)	(6)	(10)	(10)	(13)	(19)	(21)	(22)	(20)	(16)
	122	109	117	144	197	7	9	9	15	6	22	25	24	18	16
	123	139	122	131	186	6	6	13	11	10	24	21	15	21	18
1563	(123)	(124)	(120)	(138)	(192)	(7)	(8)	(11)	(13)	(8)	(23)	(23)	(20)	(20)	(17)
	135	119	116	139	162	10	3	10	11	13	11	23	18	16	16
	150	134	128	151	195	6	7	13	9	7	24	18	23	20	14
3125	(143)	(127)	(122)	(145)	(179)	(8)	(5)	(12)	(10)	(10)	(18)	(21)	(21)	(18)	(15)
	117	136	129	137	160	8	7	13	15	7	23	34	32	26	14
	122	133	139	152	198	9	8	9	13	8	24	13	24	22	15
6250	(120)	(135)	(134)	(145)	(179)	(9)	(8)	(11)	(14)	(8)	(24)	(24)	(28)	(24)	(15)
	151	145	155	142	159	7	7	15	6	8	13	21	30	23	17
	117	128	119	129	172	5	8	10	7	9	21	44	29	16	18
12500	(134)	(137)	(137)	(136)	(166)	(6)	(8)	(13)	(7)	(9)	(17)	(33)	(30)	(20)	(18)
	137 *	117	116	121	164	7 *	8	10	6	15	18	33	29	20	22
	135 *	155	141	145	156	5 *	7	10	10	11	24	33	16	18	17
25000	(136 *)	(136)	(129)	(133)	(160)	(6 *)	(8)	(10)	(8)	(13)	(21)	(33)	(23)	(19)	(20)
Judgement	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
Specific Mutagenicity															
Positive Control	AF-2 (724)	2-AA (778)	2-AA/2.0 (1056)	2-AA (4236)	2-AA/1.0 (3231)	NaN_3 (281)	2-AA (365)	2-AA/5.0 (259)	2-AA (639)	2-AA/5.0 (456)	AF-2 (310)	2-AA (278)	2-AA (1054)	2-AA (811)	2-AA (1276)

Conc. μg/plate	Number of Revertants/plate									
	Frame-shift									
	TA98					TA1537				
H_2O	S9−	RatS9+/ 10%	RatS9+/ 30%	Hamster S9+/10%	Hamster S9+/30%	S9−	RatS9+/ 10%	RatS9+/ 30%	Hamster S9+/10%	Hamster S9+/30%
	(16)	(27)	(25)	(26)	(21)	(7)	(9)	(12)	(9)	(9)
	14	26	32	24	38	9	14	14	5	15
	15	23	38	18	18	13	10	13	6	10
195	(15)	(25)	(35)	(21)	(28)	(11)	(12)	(14)	(6)	(13)
	22	25	25	24	9	7	5	5	17	8
	22	24	16	28	18	9	9	8	10	11
391	(22)	(25)	(21)	(26)	(14)	(8)	(7)	(7)	(14)	(10)
	17	26	23	33	18	8	7	18	2	14
	16	18	22	31	13	9	14	13	9	10
781	(17)	(22)	(23)	(32)	(16)	(9)	(11)	(16)	(6)	(12)
	14	32	29	24	15	9	8	10	8	3
	11	28	14	31	14	2	7	17	6	8
1563	(13)	(30)	(22)	(28)	(15)	(6)	(8)	(14)	(7)	(6)
	23	30	34	28	21	13	6	6	16	14
	21	28	24	26	8	10	10	6	7	9
3125	(22)	(29)	(29)	(27)	(15)	(12)	(8)	(6)	(12)	(12)
	15	23	34	31	17	6	8	6	9	14
	15	32	29	25	26	7	9	13	7	6
6250	(15)	(28)	(32)	(28)	(22)	(7)	(9)	(10)	(8)	(10)
	14	21	26	21	20	7	10	11	6	9
	24	34	30	26	20	5	16	8	20	13
12500	(19)	(28)	(28)	(24)	(20)	(6)	(13)	(10)	(13)	(11)
	17 *	26	30	33	28	7 *	8	13	5	5
	17 *	32	36	29	15	11 *	9	11	13	8
25000	(17 *)	(29)	(33)	(31)	(22)	(9 *)	(9)	(12)	(9)	(7)
Judgement	−	−	−	−	−	−	−	−	−	−
Specific Mutagenicity										
Positive Control	AF-2 (764)	2-AA (208)	2-AA/1.0 (307)	2-AA (582)	2-AA/2.0 (1022)	9-AA (749)	2-AA (203)	2-AA/5.0 (186)	2-AA (935)	2-AA/5.0 (879)

Conc. %	Number of Revertants/plate								Number of Revertants/plate			
	Base-substitution								Frame-shift			
	TA100		TA1535		WP2*uvr*A		WP2*uvr*A/pKM101		TA98		TA1537	
	S9−	S9+	S9−	S9+	S9−	S9+	S9−	S9+	S9−	S9+	S9−	S9+
Air	(117)	(130)	(8)	(9)	(29)	(38)	(41)	(64)	(12)	(26)	(7)	(10)
	114	134	9	13	23	41	45	67	20	9	3	11
	146	105	7	9	33	31	40	67	17	18	6	7
0 .1	(130)	(120)	(8)	(11)	(28)	(36)	(43)	(67)	(19)	(14)	(5)	(9)
	104	109	6	13	28	30	47	68	11	21	6	14
	106	112	11	7	30	34	33	55	17	25	9	5
0 .5	(105)	(111)	(9)	(10)	(29)	(32)	(40)	(62)	(14)	(23)	(8)	(10)
	114	134	9	7	28	28	49	68	13	26	7	9
	119	116	9	10	30	24	41	47	15	28	3	9
1 .0	(117)	(125)	(9)	(9)	(29)	(26)	(45)	(58)	(14)	(27)	(5)	(9)
	104	130	6	9	28	29	43	71	7	28	5	8
	115	127	6	7	32	24	47	83	15	14	5	11
5 .0	(110)	(129)	(6)	(8)	(30)	(27)	(45)	(77)	(11)	(21)	(5)	(10)
	109	113	7	6	21	29		64	13	15	3	14
	112	116	6	6	29	40	− [a]	54	15	20	6	8
10	(111)	(115)	(7)	(6)	(25)	(35)		(59)	(14)	(18)	(5)	(11)
	99	215	8	8	36	31		81	8	31	2	1
	109	176	6	10	41	44	− [a]	63	13	16	3	2
50	(104)	(196)	(7)	(9)	(39)	(38)		(72)	(11)	(24)	(3)	(2)
Judgement	−	−	−	−	−	−	−	−	−	−	−	−
Specific Mutagenicity												
Positive Control	AF-2 (798)	2-AA (502)	NaN_3 (432)	2-AA (306)	AF-2 (193)	2-AA (1146)	AF-2 (1133)	2-AA (223)	AF-2 (620)	2-AA (601)	9-AA (740)	2-AA (233)

a) Number of Revertants could not be measured accurately.

Experimental Data-4

Conc. %	Number of Revertants/plate											
	Base-substitution								Frame-shift			
	TA100		TA1535		WP2*uvr*A		WP2*uvr*A/pKM101		TA98		TA1537	
	S9−	S9+	S9−	S9+	S9−	S9+	S9−	S9+	S9−	S9+	S9−	S9+
Air	(115)	(118)	(11)	(14)	(28)	(35)	(53)	(82)	(13)	(23)	(7)	(6)
	145	100	3	16	33	30	52	69	14	17	3	9
	114	111	11	9	30	39	47	52	21	22	9	8
1 .0	(130)	(106)	(7)	(13)	(32)	(35)	(50)	(61)	(18)	(20)	(6)	(9)
	124	115	3	14	36	28	43	60	18	29	15	9
	109	113	14	8	33	31	49	76	17	20	7	7
2 .0	(117)	(114)	(9)	(11)	(35)	(30)	(46)	(68)	(18)	(25)	(11)	(8)
	99	109	13	14	28	38	40	70	14	16	6	11
	127	115	8	11	26	29	39	77	8	23	5	9
5 .0	(113)	(112)	(11)	(13)	(27)	(34)	(40)	(74)	(11)	(20)	(6)	(10)
	113	107	5	17	33	30	45	63	10	20	6	9
	91	100	9	11	22	25	51	69	9	15	9	5
10	(102)	(104)	(7)	(14)	(28)	(28)	(48)	(66)	(10)	(18)	(8)	(7)
	119	105	11	9	21	21	45	53	14	23	5	9
	77	84	7	9	14	28	31	69	13	21	7	7
20	(98)	(95)	(9)	(9)	(18)	(25)	(38)	(61)	(14)	(22)	(6)	(8)
	109	108	3	11	23	38	72	71	18	22	6	1
	131	106	8	8	23	32	49	72	17	26	3	5
50	(120)	(107)	(6)	(10)	(23)	(35)	(61)	(72)	(18)	(24)	(5)	(3)
Judgement	−	−	−	−	−	−	−	−	−	−	−	−
Specific Mutagenicity												
Positive Control	AF-2 (708)	2-AA (1338)	NaN_3 (417)	2-AA (386)	AF-2 (167)	2-AA (1294)	AF-2 (1120)	2-AA (916)	AF-2 (502)	2-AA (345)	9-AA (653)	2-AA (200)

Experimental Data-5

Conc. %	Number of Revertants/plate	
	Base-substitution	
	WP2*uvr*A/pKM101	
	S9−	S9+
Air	(28)	(54)
	22	55
	18	53
1 .0	(20)	(54)
	28	63
	34	69
2 .0	(20)	(66)
	36	51
	33	48
5 .0	(35)	(50)
	46	53
	36	61
10	(41)	(57)
	23	53
	37	54
20	(30)	(54)
	46	68
	41	70
50	(44)	(69)
Judgement	−	−
Specific Mutagenicity		
Positive Control	AF-2 (603)	2-AA (1122)