CONVERSION FACTORS FOR IONIZING RADIATION

Conversion Between SI and Other Units

Quantity	Symbol for quantity	Expression in SI units	Expression in symbols for SI units	Special name for SI units	Symbols using special names	Conventional units	Symbol for conventional unit	Value of conventional unit in SI units
Activity	A	1 per second	s^{-1}	becquerel	Bq	curie	Ci	3.7×10^{10} Bq
Absorbed dose	D	joule per kilogram	$J\ kg^{-1}$	gray	Gy	rad	rad	0.01 Gy
Absorbed dose rate	$\dot{D}$	joule per kilogram second	$J\ kg^{-1}\ s^{-1}$		$Gy\ s^{-1}$	rad	rad s^{-1}	0.01 Gy s^{-1}
Average energy per ion pair	W	joule	J			electronvolt	eV	1.602×10^{-19} J
Dose equivalent	H	joule per kilogram	$J\ kg^{-1}$	sievert	Sv	rem	rem	0.01 Sv
Dose equivalent rate	$\dot{H}$	joule per kilogram second	$J\ kg^{-1}\ s^{-1}$		$Sv\ s^{-1}$	rem per second	rem s^{-1}	0.01 Sv s^{-1}
Electric current	I	ampere	A			ampere	A	1.0 A
Electric potential difference	U, V	watt per ampere	$W\ A^{-1}$	volt	V	volt	V	1.0 V
Exposure	$\dot{X}$	coulomb per kilogram	$C\ kg^{-1}$			roentgen	R	2.58×10^{-4} C kg^{-1}
Exposure rate	X	coulomb per kilogram second	$C\ kg^{-1}\ s^{-1}$			roentgen	R s^{-1}	2.58×10^{-4} C kg^{-1} s^{-1}
Fluence	ϕ	1 per meter squared	m^{-2}			1 per centimeter squared	cm^{-2}	1.0×10^{4} m^{-2}
Fluence rate	Φ	1 per meter squared second	$m^{-2}\ s^{-1}$			1 per centimeter squared second	$cm^{-2}\ s^{-1}$	1.0×10^{4} m^{-2} s^{-1}
Kerma	K	joule per kilogram	$J\ kg^{-1}$	gray	Gy	rad	rad	0.01 Gy
Kerma rate	$\dot{K}$	joule per kilogram second	$J\ kg^{-1}\ s^{-1}$		$Gy\ s^{-1}$	rad per second	rad s^{-1}	0.01 Gy s^{-1}
Lineal energy	y	joule per meter	$J\ m^{-1}$			kiloelectron volt per micrometer	keV μm^{-1}	1.602×10^{-10} J m^{-1}
Linear energy transfer	L	joule per meter	$J\ m^{-1}$			kiloelectron volt per micrometer	keV μm^{-1}	1.602×10^{-10} J m^{-1}
Mass attenuation coefficient	μ/ρ	meter squared per kilogram	$m^2\ kg^{-1}$			centimeter squared per gram	$cm^2\ g^{-1}$	0.1 m^2 kg^{-1}
Mass energy transfer coefficient	μ_{tr}/ρ	meter squared per kilogram	$m^2\ kg^{-1}$			centimeter squared per gram	$cm^2\ g^{-1}$	0.1 m^2 kg^{-1}
Mass energy absorption coefficient	μ_{en}/ρ	meter squared per kilogram	$m^2\ kg^{-1}$			centimeter squared per gram	$cm^2\ g^{-1}$	0.1 m^2 kg^{-1}
Mass stopping power	S/ρ	joule meter squared per kilogram	$J\ m^2\ kg^{-1}$			MeV centimeter squared per gram	MeV $cm^2\ g^{-1}$	1.602×10^{-14} J m^2 kg^{-1}
Power	P	joule per second	$J\ s^{-1}$	watt	W	watt	W	1.0 W
Pressure	p	newton per meter squared	$N\ m^{-2}$	pascal	Pa	torr	torr	(101325/760)Pa
Radiation chemical yield	G	mole per joule	$mol\ J^{-1}$			molecules per 100 electron volts	molecules $(100\ eV)^{-1}$	1.04×10^{-7} mol J^{-1}
Specific energy	z	joule per kilogram	$J\ kg^{-1}$	gray	Gy	rad	rad	0.01 Gy

Conversion of Radioactivity Units from MBq to mCi and μCi

MBq	mCi	MBq	mCi	MBq	mCi	MBq	mCi	MBq	mCi
7000	189.	700	18.9	70	1.89	7	189	0.7	18.9
6000	162.	600	16.2	60	1.62	6	162	0.6	16.2
5000	135.	500	13.5	50	1.35	5	135	0.5	13.5
4000	108.	400	10.8	40	1.08	4	108	0.4	10.8
3000	81.	300	8.1	30	810	3	81	0.3	8.1
2000	54.	200	5.4	20	540	2	54	0.2	5.4
1000	27.	100	2.7	10	270	1	27	0.1	2.7
900	24.	90	2.4	9	240	0.9	24		
800	21.6	80	2.16	8	220	0.8	21.6		

Conversion of Radioactivity Units from mCi and μCi to MBq

mCi	MBq	mCi	MBq	mCi	MBq	μCi	MBq	μCi	MBq	μCi	MBq
200	7400	40	1480	5	185	1000	37.0	200	7.4	30	1.11
150	5550	30	1110	4	148	900	33.3	100	3.7	20	0.74
100	3700	20	740	3	111	800	29.6	90	3.33	10	0.37
90	3330	10	370	2	74.0	700	25.9	80	2.96	5	0.185
80	2960	9	333	1	37.0	600	22.2	70	2.59	2	0.074
70	2590	8	296			500	18.5	60	2.22	1	0.037
60	2220	7	259			400	14.8	50	1.85		
50	1850	6	222			300	11.1	40	1.48		

Conversion of Radioactivity Units

100 TBq (10^{14} Bq)	=	2.7 kCi (2.7×10^{3} Ci)
10 TBq (10^{13} Bq)	=	270 Ci (2.7×10^{2} Ci)
1 TBq (10^{12} Bq)	=	27 Ci (2.7×10^{1} Ci)
100 GBq (10^{11} Bq)	=	2.7 Ci (2.7×10^{0} Ci)
10 GBq (10^{10} Bq)	=	270 mCi (2.7×10^{-1} Ci)
1 GBq (10^{9} Bq)	=	27 mCi (2.7×10^{-2} Ci)
100 MBq (10^{8} Bq)	=	2.7 mCi (2.7×10^{-3} Ci)
10 MBq (10^{7} Bq)	=	270 μCi (2.7×10^{-4} Ci)
1 MBq (10^{6} Bq)	=	27 μCi (2.7×10^{-5} Ci)

100 kBq (10^{5} Bq)	=	2.7 μCi (2.7×10^{-6}Ci)
10 kBq (10^{4} Bq)	=	270 nCi (2.7×10^{-7} Ci)
1 kBq (10^{3} Bq)	=	27 nCi (2.7×10^{-8} Ci)
100 Bq (10^{2} Bq)	=	2.7 nCi (2.7×10^{-9} Ci)
10 Bq (10^{1} Bq)	=	270 pCi (2.7×10^{-10} Ci)
1 Bq (10^{0} Bq)	=	27 pCi (2.7×10^{-11} Ci)
100 mBq (10^{-1} Bq)	=	2.7 pCi (2.7×10^{-12} Ci)
10 mBq (10^{-2} Bq)	=	270 fCi (2.7×10^{-13} Ci)
1 mBq (10^{-3} Bq)	=	27 fCi (2.7×10^{-14} Ci)

Conversion of Absorbed Dose Units

SI Units		Conventional
100 Gy (10^{2} Gy)	=	10,000 rad (10^{4} rad)
10 Gy (10^{1} Gy)	=	1,000 rad (10^{3} rad)
1 Gy (10^{0} Gy)	=	100 rad (10^{2} rad)
100 mGy (10^{-1} Gy)	=	10 rad (10^{1} rad)
10 mGy (10^{-2} Gy)	=	1 rad (10^{0} rad)
1 mGy (10^{-3} Gy)	=	100 mrad (10^{-1} rad)

SI Units		Conventional
100 μGy (10^{-4} Gy)	=	10 mrad (10^{-2} rad)
10 μGy (10^{-5} Gy)	=	1 mrad (10^{-3} rad)
1 μGy (10^{-6} Gy)	=	100 μrad (10^{-4} rad)
100 nGy (10^{-7} Gy)	=	10 μrad (10^{-5} rad)
10 nGy (10^{-8} Gy)	=	1 μrad (10^{-6} rad)
1 nGy (10^{-9} Gy)	=	100 nrad (10^{-7} rad)

Conversion of Dose Equivalent Units

100 Sv (10^{2} Sv)	=	10,000 rem (10^{4} rem)
10 Sv (10^{1} Sv)	=	1,000 rem (10^{3} rem)
1 Sv (10^{0} Sv)	=	100 rem (10^{2} rem)
100 mSv (10^{-1} Sv)	=	10 rem (10^{1} rem)
10 mSv (10^{-2} Sv)	=	1 rem (10^{0} rem)
1 mSv (10^{-3} Sv)	=	100 mrem (10^{-1} rem)

100 μSv (10^{-4} Sv)	=	10 mrem (10^{-2} rem)
10 μSv (10^{-5} Sv)	=	1 mrem (10^{-3} rem)
1 μSv (10^{-6} Sv)	=	100 μrem (10^{-4} rem)
100 nSv (10^{-7} Sv)	=	10 μrem (10^{-5} rem)
10 nSv (10^{-8} Sv)	=	1 μrem (10^{-6} rem)
1 nSv (10^{-9} Sv)	=	100 nrem (10^{-7} rem)