

²⁰⁶Fr α decay (0.7 s) 1992Hu04,2016Ly01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 196,342 (2024)	1-Sep-2023

Parent: ²⁰⁶Fr: E=730 40; J ^{π} =10⁻; T_{1/2}=0.7 s 1; Q(α)=6923 3; % α decay=13 2

²⁰⁶Fr-E: From 2021Ko07.

²⁰⁶Fr-J ^{π} : From 2015Vo05 and 2016Ly01; π from μ .

²⁰⁶Fr-T_{1/2}: From 2008Ko21.

²⁰⁶Fr-Q(α): From 2021Wa16.

²⁰⁶Fr-% α decay: From 2016Ly01.

1992Hu04: ²⁰⁶Fr was produced in ^{nat}Ir(²⁰Ne,xn) and ¹⁸¹Ta(³²S,2p5n) reactions, and separated at the Leuven Isotope Separator On-Line (LISOL) facility. Recoils were implanted into a Mylar tape that periodically moved the source from the implantation station to the decay station. Detectors: 2 Ge and 1 Ge LEPS (γ rays), 1 Si(Li) (CE), several surface-barrier and PIPS detectors (α particles). Measured: $\alpha\gamma$ (t) and α -X(t).

2016Ly01: ²⁰⁶Fr was produced in the bombardment of 1.4 GeV protons on a Uranium carbide target at the ISOLDE-CERN facility. Recoils were selected by a high-resolution mass separator, injected into the ISCOOL cooler and buncher, resonantly excited with pulsed laser beams and implanted on a thin (20 $\mu\text{g}/\text{cm}^2$) C foil. Alpha particles were measured using PIPS detectors.

Others: 1961Gr42, 1964Gr04, 1967Va20, 1974Ho27 and 1981Ri04.

²⁰²At Levels

E(level) [†]	J ^{π} [†]	T _{1/2} [†]
0	3 ⁺	184 s 1
190 40	7 ⁺	182 s 2
582 40	10 ⁻	0.46 s 5

[†] From Adopted Levels.

α radiations

E α	E(level)	I α [‡]	HF [†]	Comments
6930 5	582	≈ 100	≈ 2.2	E α : From 1981Ri04 and 1992Hu04.

[†] $r_0(^{202}\text{At})=1.507$ 8, unweighted average of 1.5026 13 (²⁰⁰Po), 1.4917 27 (²⁰²Po), 1.5287 42 (²⁰²Rn) and 1.5029 39 (²⁰⁴Rn) from 2020Si16.

[‡] For absolute intensity per 100 decays, multiply by 0.13 2.

$\gamma(^{202}\text{At})$

E _i (level)	J _i ^{π}	E γ	I γ	E _f	J _f ^{π}	Mult.	α [†]	Comments
582	10 ⁻	391.7 2	100 4	190	7 ⁺	E3	0.268	$\alpha(\text{K})=0.0987$ 14; $\alpha(\text{L})=0.1249$ 18; $\alpha(\text{M})=0.0336$ 5; $\alpha(\text{N+..})=0.01070$ 16 $\alpha(\text{N})=0.00875$ 13; $\alpha(\text{O})=0.001757$ 25; $\alpha(\text{P})=0.000194$ 3 E γ : From 1992Hu04; other: 391 keV (1981Ri04). Mult.: From the $\alpha(\text{K})_{\text{exp}}=0.088$ 12 and K/L=0.62 1 in 1992Hu04.

[†] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

^{206}Fr α decay (0.7 s) 1992Hu04,2016Ly01Decay Scheme

Intensities: Relative photon branching from each level

