^{27}Al(^{19}F,$\alpha\gamma$)   1981He20

1981He20 (also 1981He17): E=47-108 MeV ^{19}F beam produced at the MP-Tandem at the MPI in Heidelberg. Main experiment for ^{42}Ca at E=72 MEV. Targets of 1 mg/cm^2 Al on Au backings of 100 mg/cm^2. γ-rays were detected with two Ge(Li) of 26% relative efficiency, FWHM=1.9 keV and 2.1 keV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma(\theta)$. Deduced levels, J^π, γ-ray mixing ratios.
Others: 1976Po03, 1975Ol01: E=40 MeV. Measured cross sections.

^{42}Ca Levels

E(level)[†]	J^{π}[‡]	Comments
0.0	0^+	
1524.61 8	2^+	
2752.29 12	4^+	
3189.37 19	6^+	
4099.6 7	5^-	
5491.1 8	6^-	
5744.3 6	7^-	
6145.1 8	7^-	
6408.8 6	8^-	
6553.8 6	9^-	
7368.3 6	$(10)^-$	
7750.5 6	$(11)^-$	
8297.1 6	$(9)^-$	J^π: $(11)^-$ in Adopted Levels.
8522.1 7	(10)	

[†] Deduced by the evaluators from Eγ values.
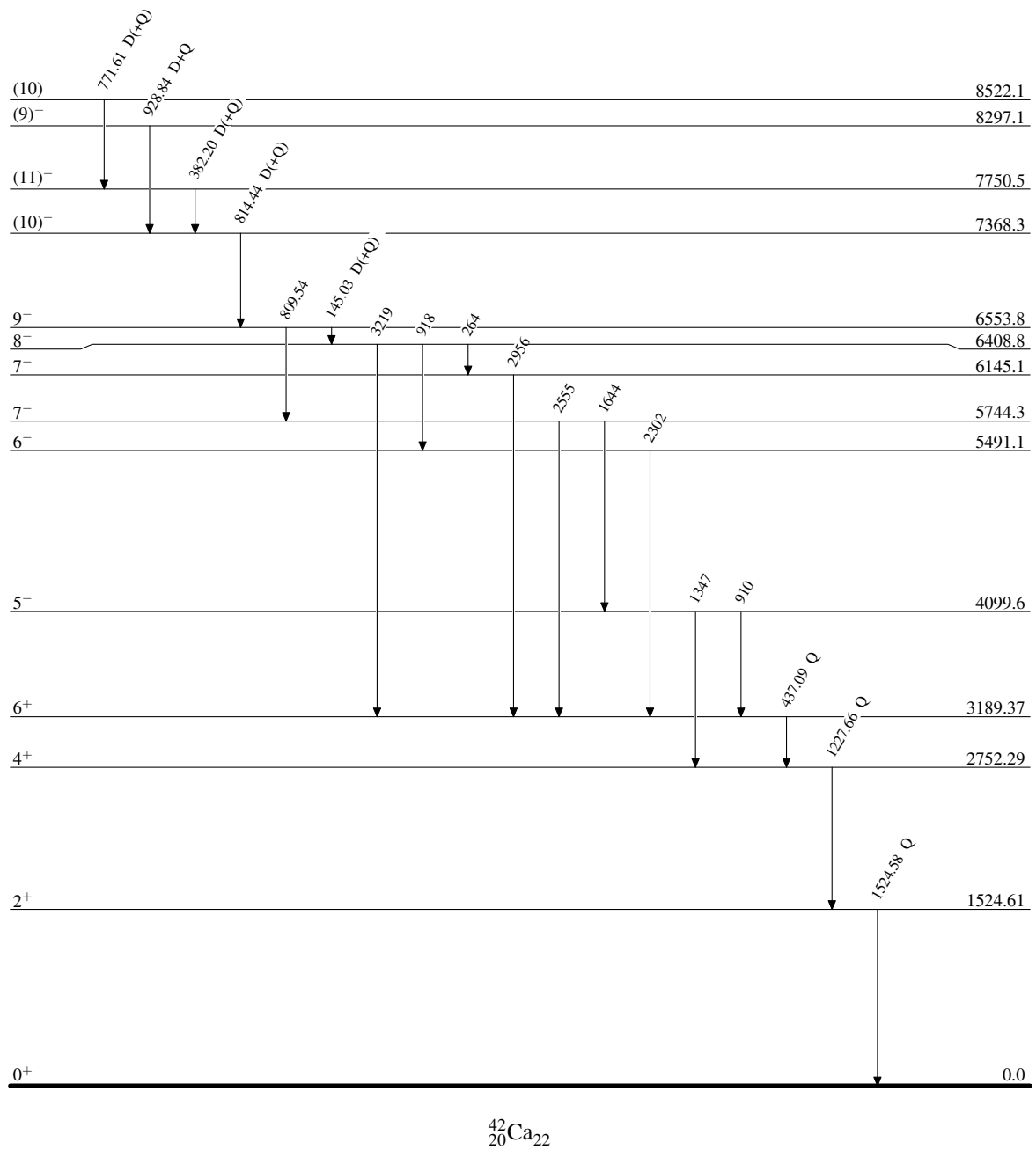[‡] From $\gamma(\theta)$ in 1981He20.

$\gamma(^{42}$Ca)

E$_\gamma$	E$_i$(level)	J^π_i	E$_f$	J^π_f	Mult.	δ	Comments
145.03[†] 10	6553.8	9^-	6408.8	8^-	D(+Q)	+0.03 2	A$_2$=−0.24 3; A$_4$=0
264	6408.8	8^-	6145.1	7^-			
382.20[†] 8	7750.5	$(11)^-$	7368.3	$(10)^-$	D(+Q)	+0.02 7	A$_2$=−0.24 4; A$_4$=0
437.09[†] 15	3189.37	6^+	2752.29	4^+	Q		A$_2$=+0.21 3; A$_4$=−0.07 3
771.61 20	8522.1	(10)	7750.5	$(11)^-$	D(+Q)	0.00 4	A$_2$=−0.15 5; A$_4$=0
809.54[†] 15	6553.8	9^-	5744.3	7^-			A$_2$=+0.29 5; A$_4$=−0.05 5
814.44[†] 15	7368.3	$(10)^-$	6553.8	9^-	D(+Q)	0.00 2	A$_2$=−0.18 5; A$_4$=0
910	4099.6	5^-	3189.37	6^+			
918	6408.8	8^-	5491.1	6^-			
928.84[†] 19	8297.1	$(9)^-$	7368.3	$(10)^-$	D+Q	−0.11 5	A$_2$=−0.27 4; A$_4$=0
1227.66[†] 8	2752.29	4^+	1524.61	2^+	Q		A$_2$=+0.24 3; A$_4$=−0.05 3
1347	4099.6	5^-	2752.29	4^+			
1524.58[†] 8	1524.61	2^+	0.0	0^+	Q		A$_2$=+0.34 4; A$_4$=−0.12 4
1644	5744.3	7^-	4099.6	5^-			
2302	5491.1	6^-	3189.37	6^+			
2555	5744.3	7^-	3189.37	6^+			
2956	6145.1	7^-	3189.37	6^+			
3219	6408.8	8^-	3189.37	6^+			

[†] 1981He20 take value from 1978Eg02. In their level-scheme figure, 1981He20 give Eγ values rounded to nearest keV.

^{27}Al(^{19}F,$\alpha\gamma$)　　**1981He20**

Level Scheme

$^{42}_{20}$Ca$_{22}$