

## TAVOLA PERIODICA DEI NUCLEI ATOMICI

### configurazione dei livelli nucleari degli isotopi **FRANCIO Z = 87-a**

$\frac{E_c(\text{MeV})}{E_s(\text{MeV})}$	Sa	$\frac{m_c}{m_s}$	n	1	2	3	4	5	6	7	$\frac{E_p(\text{eV})}{P-T_{1/2}}$
$\frac{1531.50}{1531.4}$	Fr <sub>87</sub> <sup>199</sup>	$\frac{199.00712}{199.00726}$	87n	2+0	8+0	18+0	32+0	1+16	1+8	0+1	$\frac{7.810M}{\alpha 12.0ms}$
$\frac{1539.72}{1540.1}$	Fr <sub>87</sub> <sup>200</sup>	$\frac{200.00696}{200.00657}$	87n	2+0	8+0	18+0	32+0	0+17	1+8	0+1	$\frac{7.620M}{\alpha 49.0ms}$
$\frac{1550.88}{1550.7}$	Fr <sub>87</sub> <sup>201</sup>	$\frac{201.00364}{201.00386}$	87n	2+0	8+0	18+0	30+1	0+18	1+8	1+0	$\frac{7.520M}{\alpha 62.0ms}$
$\frac{1559.10}{1559.2}$	Fr <sub>87</sub> <sup>202</sup>	$\frac{202.00348}{202.00337}$	87n	2+0	8+0	18+0	28+2	1+18	1+8	1+0	$\frac{7.389M}{\alpha 300ms}$
$\frac{1569.16}{1569.6}$	Fr <sub>87</sub> <sup>203</sup>	$\frac{203.00135}{203.000925}$	87n	2+0	8+0	18+0	28+2	1+19	0+8	1+0	$\frac{7.275M}{\alpha 550ms}$
$\frac{1578.11}{1577.9}$	Fr <sub>87</sub> <sup>204</sup>	$\frac{204.000403}{204.000653}$	87n	2+0	8+0	18+0	28+2	1+20	0+7	0+1	$\frac{7.1704M}{\alpha 1.80s}$
$\frac{1587.43}{1587.9}$	Fr <sub>87</sub> <sup>205</sup>	$\frac{204.99906}{204.998594}$	87n	2+0	8+0	18+0	26+3	0+21	1+7	1+0	$\frac{7.0546M}{\alpha 3.97s}$
$\frac{1595.65}{1595.9}$	Fr <sub>87</sub> <sup>206</sup>	$\frac{205.99890}{205.99867}$	87n	2+0	8+0	18+0	24+4	1+21	1+7	1+0	$\frac{6.923M}{ce 16s}$
$\frac{1605.71}{1605.5}$	Fr <sub>87</sub> <sup>207</sup>	$\frac{206.99677}{206.99695}$	87n	2+0	8+0	18+0	24+4	1+22	0+7	1+0	$\frac{6.900M}{ce 14.8s}$
$\frac{1613.93}{1613.4}$	Fr <sub>87</sub> <sup>208</sup>	$\frac{207.99661}{207.99714}$	87n	2+0	8+0	18+0	24+4	0+23	0+7	1+0	$\frac{6.780M}{\alpha 59.1s}$
$\frac{1622.15}{1622.6}$	Fr <sub>87</sub> <sup>209</sup>	$\frac{208.99645}{208.995954}$	87n	2+0	8+0	18+0	22+5	1+23	0+7	1+0	$\frac{6.777M}{\alpha 50.5s}$
$\frac{1630.37}{1630.3}$	Fr <sub>87</sub> <sup>210</sup>	$\frac{209.99629}{209.996408}$	87n	2+0	8+0	18+0	22+5	0+24	0+7	1+0	$\frac{6.672M}{\alpha 3.18m}$
$\frac{1638.59}{1639.1}$	Fr <sub>87</sub> <sup>211</sup>	$\frac{210.99613}{210.995537}$	87n	2+0	8+0	18+0	20+6	1+24	0+7	1+0	$\frac{6.662M}{\alpha 3.10m}$
$\frac{1646.82}{1646.6}$	Fr <sub>87</sub> <sup>212</sup>	$\frac{211.99596}{211.996202}$	87n	2+0	8+0	18+0	20+6	0+25	0+7	1+0	$\frac{5.145M}{ce 20.0m}$
$\frac{1653.20}{1654.7}$	Fr <sub>87</sub> <sup>213</sup>	$\frac{212.99777}{212.996189}$	87n	2+0	8+0	18+0	18+7	0+25	1+7	1+0	$\frac{6.904M}{\alpha 34.82s}$
$\frac{1659.59}{1660.2}$	Fr <sub>87</sub> <sup>214</sup>	$\frac{213.99958}{213.998971}$	87n	2+0	8+0	18+0	18+7	0+25	0+8	1+0	$\frac{8.589M}{\alpha 5.0m}$

$\frac{E_c(\text{MeV})}{E_s(\text{MeV})}$	Sa	$\frac{m_c}{m_s}$	n	1	2	3	4	5	6	7	$\frac{E_p(\text{eV})}{p-T_{1/2}}$
$\frac{1665.98}{1667.0}$	Fr <sub>87</sub> <sup>215</sup>	$\frac{215.00138}{215.000341}$	87n	2+0	8+0	18+0	16+8	0+25	1+8	1+0	$\frac{9.540M}{\alpha 86.0ns}$
$\frac{1672.37}{1672.4}$	Fr <sub>87</sub> <sup>216</sup>	$\frac{216.003198}{216.003198}$	87n	2+0	8+0	18+0	16+8	0+25	0+9	1+0	$\frac{9.174M}{\alpha 700ns}$
$\frac{1678.75}{1679.1}$	Fr <sub>87</sub> <sup>217</sup>	$\frac{217.00500}{217.004632}$	87n	2+0	8+0	18+0	14+9	0+25	1+9	1+0	$\frac{8.469M}{\alpha 19.0\mu s}$
$\frac{1684.04}{1684.4}$	Fr <sub>87</sub> <sup>218</sup>	$\frac{218.00799}{218.007578}$	87n	2+0	8+0	18+0	14+9	0+25	1+9	0+1	$\frac{8.014M}{\alpha 1.0ms}$
$\frac{1690.43}{1690.9}$	Fr <sub>87</sub> <sup>219</sup>	$\frac{219.009795}{219.009252}$	87n	2+0	8+0	18+0	14+9	0+25	0+10	0+1	$\frac{7.4485M}{\alpha 20.0ms}$
$\frac{1696.81}{1696.1}$	Fr <sub>87</sub> <sup>220</sup>	$\frac{220.01161}{220.012327}$	87n	2+0	8+0	18+0	12+10	0+25	1+10	0+1	$\frac{6.8007M}{\alpha 27.4s}$
$\frac{1703.58}{1702.6}$	Fr <sub>87</sub> <sup>221</sup>	$\frac{221.01301}{221.014255}$	87n	2+0	8+0	18+0	10+11	1+24	1+12	0+0	$\frac{6.4578M}{\alpha 286.1s}$
$\frac{1708.13}{1707.4}$	Fr <sub>87</sub> <sup>222</sup>	$\frac{222.01679}{222.017552}$	87n	2+0	8+0	18+0	10+11	0+24	1+13	0+0	$\frac{2.028M}{\beta^- 14.2m}$
$\frac{1714.52}{1713.5}$	Fr <sub>87</sub> <sup>223</sup>	$\frac{223.01859}{223.019736}$	87n	2+0	8+0	18+0	10+11	0+24	0+14	0+0	$\frac{1.1492M}{\beta^- 22.0m}$
$\frac{1719.07}{1718.3}$	Fr <sub>87</sub> <sup>224</sup>	$\frac{224.02237}{224.02325}$	87n	2+0	8+0	18+0	8+12	1+23	0+15	0+0	$\frac{2.830M}{\beta^- 3.33m}$
$\frac{1723.63}{1724.2}$	Fr <sub>87</sub> <sup>225</sup>	$\frac{225.02614}{225.02557}$	87n	2+0	8+0	18+0	8+12	0+23	0+16	0+0	$\frac{1.820M}{\beta^- 3.95m}$
$\frac{1728.18}{1728.7}$	Fr <sub>87</sub> <sup>226</sup>	$\frac{226.02992}{226.02939}$	87n	2+0	8+0	18+0	6+13	1+22	0+17	0+0	$\frac{3.700M}{\beta^- 49.0s}$
$\frac{1734.57}{1734.5}$	Fr <sub>87</sub> <sup>227</sup>	$\frac{227.03173}{227.03184}$	87n	2+0	8+0	18+0	4+14	1+22	1+17	0+0	$\frac{2.480M}{\beta^- 2.47m}$
$\frac{1739.12}{1738.9}$	Fr <sub>87</sub> <sup>228</sup>	$\frac{228.03551}{228.03573}$	87n	2+0	8+0	18+0	4+14	0+22	1+18	0+0	$\frac{4.340M}{\beta^- 38.0s}$
$\frac{1744.40}{1744.5}$	Fr <sub>87</sub> <sup>229</sup>	$\frac{229.03850}{229.03845}$	87n	2+0	8+0	18+0	2+15	0+22	1+18	1+0	$\frac{3.260M}{\beta^- 50.2s}$
$\frac{1748.95}{1748.7}$	Fr <sub>87</sub> <sup>230</sup>	$\frac{230.04229}{230.04251}$	87n	2+0	8+0	18+0	0+16	1+21	1+19	1+0	$\frac{4.980M}{\beta^- 19.1s}$

$\frac{E_c(\text{MeV})}{E_s(\text{MeV})}$	Sa	$\frac{m_c}{m_s}$	n	1	2	3	4	5	6	7	$\frac{E_p(\text{eV})}{\rho - T_{1/2}}$
$\frac{1754.24}{1754.1}$	$\text{Fr}_{87}^{231}$	$\frac{231.04527}{231.04544}$	87n	2+0	8+0	18+0	0+16	1+21	1+19	0+1	$\frac{4.100\text{M}}{\beta^- 17.6\text{s}}$
$\frac{1758.05}{1758.1}$	$\text{Fr}_{87}^{232}$	$\frac{232.04985}{232.04977}$	87n	2+0	8+0	16+1	0+16	1+20	1+21	1+0	$\frac{5.600\text{M}}{\beta^- 5.50\text{s}}$
$\frac{1764.44}{-}$	$\text{Fr}_{87}^{233}$	$\frac{233.05165}{-}$	87n	2+0	8+0	18+0	0+16	1+20	0+22	1+0	$\frac{4.600\text{M}}{\beta^- >300\text{ns}}$

$E_c(\text{MeV})$  = valore calcolato dell'energia di legame

$E_s(\text{MeV})$  = valore sperimentale dell'energia di legame

$m_c$  = valore calcolato della massa atomica

$m_s$  = valore sperimentale della massa atomica

$n$  = numero di neutroni centrali attivi

1-7 = numero quantico associato al livello

$p + d$  = (numero di protoni) + (numero di deutoni) in orbita

$\rho - T_{1/2}$  = particella emessa – periodo di dimezzamento

$E_p(\text{eV})$  = energia della particella emessa

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