

U(p,X) 2013Pa11,2014Kr04,2014Pa45

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Wang Jimin and Huang Xiaolong		NDS 144, 1 (2017)	1-Mar-2016

[2013Pa11](#), [2014Kr04](#), [2014Pa45](#): E(p)=1.4 GeV incident on UC_x target at ISOLDE-CERN facility. Fragments diffused out of target and surface ionized, then accelerated to 40 kV, followed by mass separation and bunched by gas-filled Paul Trap (ISCOOL). Hyperfine structure was studied by collinear laser spectroscopy using COLLAPS setup at ISOLDE-CERN. Measured hyperfine spectra. Deduced spin, magnetic moment, rms charge radius. Comparison with shell-model calculations.

[2014Pa45](#) (also [2013Pa11](#)) presents measured hyperfine parameters, hyperfine structure anomalies, spins and magnetic moments, while [2014Kr04](#) presents measured rms radii, isotope shifts and spin determinations.

 ^{51}K Levels

E(level)	J ^π	Comments
0	3/2 ⁺	<p>$\mu=+0.5129$ 27 (2013Pa11,2014Pa45); $g=+0.3420$ 18 (2013Pa11)</p> <p>$\delta\langle r^2 \rangle(^{47}\text{K}, ^{51}\text{K})=+0.538$ fm² 13(stat) 61(syst); $\delta\nu(^{47}\text{K}, ^{51}\text{K})=+273.2$ MHz 14(stat) 11(syst) (2014Kr04).</p> <p>J^π: spin from fitting of hyperfine structure with assumed spins of 3/2, 5/2 and 7/2 and comparison of intensity ratios of lines in these spectra (2013Pa11). J=5/2 and higher values are excluded at 95% confidence level.</p> <p>Comparison of experimental magnetic moments for different spin values (3/2⁺, 5/2⁺, 7/2⁺) with those calculated from shell model with three different interactions shows agreement only for 3/2⁺. Appearance of four resonances in figure 3 in 2014Pa45, figure 1 in 2013Pa11, and figure 4 in 2014Kr04 rules out J=1/2 for which maximum of three resonances are expected.</p> <p>μ: deduced from hyperfine parameters measured relative to those for ^{39}K whose parameters are known very precisely. Statistical uncertainty of 0.0022 and an uncertainty of 0.0015 due to hyperfine anomaly are added in quadrature by evaluators.</p> <p>Configuration=$\pi 1d_{3/2}^{-1}$ (90-93%) (2014Pa45) from comparison with shell-model calculations.</p>