

Impact Of Experimental Mass Of ^{70}Kr On The ^{68}Se Waiting-Point In Rp-Process

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The recent mass measurement of ^{70}Kr using the $B\rho$ -defined isochronous mass spectrometry yields a mass excess of $-41320(140)$ keV, indicating a 220-keV increase in binding energy compared to the AME2020 prediction. We utilize this experimental mass to probe its impact on the potential waiting point ^{68}Se in rp -process and quantitatively constrain the $2p$ -capture reaction flow that can bypass this waiting point. Our investigation shows that the more tightly bound nature of ^{70}Kr enhances this $2p$ -capture reaction flow up to a factor of four. While this enhancement reduces the effective half-life of ^{68}Se , the nucleus remains a waiting point. The dominate uncertainty in determining the effective half-life of and reaction flow around ^{68}Se originates from the large experimental error in the ^{70}Kr mass. A more precise ^{70}Kr mass measurement is highly desired.

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