In this note, we consider a general discrete-time spectral factorization problem for rational matrix-valued functions. We build on a recent result establishing existence of a spectral factor whose zeroes and poles lie in any pair of prescribed regions of the complex plane featuring a geometry compatible with symplectic symmetry. In this general setting, uniqueness of the spectral factor is not guaranteed. It was, however, conjectured that if we further impose stochastic minimality, uniqueness can be recovered. The main result of his note is a proof of this conjecture.