Nowadays the Atomic Spectra Database (ASD) at the National Institute of Standards and Technology (NIST) represents the only collection of evaluated and recommended spectroscopic data for many atoms and ions. As for the primary injected impurities in magnetic fusion research, it does offer hundreds of spectral lines and energy levels for such elements as N, Ne, Ar and others (Fig.1). However, not all ionization stages of these elements are well represented yet. For instance, (almost) no data for radiative transition probabilities are available in ASD for highly-charged ions Ar IX through Ar XVII. In other cases, the fundamental data on spectra wavelengths is clearly outdated and thus calls for significant updates. In this talk I will present an overview of ASD data for primary injected impurities, the potential pathways for improvement of data coverage, and basic principles and methods to generate evaluated sets of spectroscopic data for those elements of importance.

Figure 1. Line holdings in NIST ASD v.5.10 (2023).