

How is solar O abundance determined?

The solar O abundance can be inferred from a number of different atomic and molecular indicators (Table 3).

Why do we need to know the elemental abundances of the Sun?

Context. The chemical composition of the Sun is a fundamental yardstick in astronomy, relative to which essentially all cosmic objects are referenced. As such, having accurate knowledge of the solar elemental abundances is crucial for an extremely broad range of topics. Aims.

Are solar abundances a basis for chemical composition?

Present-day and proto-solar Solar System abundances With the Sun providing $> 99.85\%$ of the total mass in the Solar System, we can safely adopt the solar abundances as the basis of the chemical composition of the solar system overall.

What are photospheric abundances?

The photospheric abundances are certainly not without shortcomings themselves. While often referred to as observed elemental abundances, the chemical composition of the Sun cannot be directly measured from the observed solar spectrum.

How many spectroscopic abundance sets are there?

Currently there are two abundance sets to be considered, depending on which solar model atmospheres were used in the evaluation of spectroscopic observations. One set in Table 2 uses traditional 1D solar atmospheric models, the other set uses 3D atmospheric models, which contain more detailed descriptions of the physics in the solar atmosphere.

What is the recommended solar photospheric V abundance?

Vanadium ($Z = 23$). The recommended solar photospheric V abundance of Scott et al. (2015a) was based on a 3D LTE analysis of V I lines with an ad hoc non-LTE correction of 0.10 dex across the board in the absence of actual statistical equilibrium calculations based on the behaviour of Sc and Ti in 1D model atmospheres.

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the helium abundance of the solar envelope and the location of the bottom of the convection zone). The former approach is model-insensitive; in contrast, the latter approach depends ...

The HM model is the favoured model of solar abundance analysis; owing to its temperature stratification, it is expected to be an accurate representation of the real ...

Their analysis also showed that exoplanets with exotic compositions, e.g., mantles made of albite, corundum, rutile, clinopyroxene, or garnet, may be incredibly rare, if ...

The solar abundance of lithium and its isotopic abundance ratio were determined by comparing synthetic spectra with the high quality center-to-limb spectra of the solar lithium feature ...

The abundance trends for Mg, Si, S, and Ca are shown in Figs. 2-5, respectively, with the trends from each individual line in the top panels and the mean abundance estimated from all lines in ...

undertake a similar approach studying the solar abundance of nitrogen, since this element accounts for a significant fraction of the overall solar metallicity, Z . Methods. We used a ...

We calculate these differences as $(CI/P-1)$ or $(CI/G-1)$ where CI, P, and G represent the CI chondrite abundance (Lodders 2021), the photospheric abundance (Asplund ...

THE LTE SOLAR ABUNDANCE OF NEODYMIUM A.G. A. Abdelkawy, A.M.K. Shaltout, M.M. Beheary and A. Bakry Department of Astronomy and Meteorology, Faculty of Science, Al ...

Solar abundances play a key role in astrophysics as they are the abundances relative to which all others are measured. Opacity is determined in metal-rich objects by the iron abundance and ...

Figure 4: Solar disc-integrated flux spectrum in the vicinity of the BeII absorption lines. A fit with LTE and non-LTE models are shown, where $A(\text{Be}) = 1.32$ is assumed. Taken from Korotin & ...

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