

## 8.1: Introduction

---

A measurement of the strength of a spectrum line can in principle enable us to determine the number of atoms *in the initial level of the transition* that produces it. For an emission line, that initial level is the upper level of the transition; for an absorption line it is the lower level. In order to determine the total number of atoms (in all energy levels) in the source, it is necessary to know, in addition to the number of atoms in a particular level, how the atoms are distributed, or partitioned, among their numerous energy levels. This is what Boltzmann's equation is concerned with. But even this will tell us only how many atoms there are in a particular ionization stage. If we are to determine the total abundance of a given element, we must also know how the atoms are distributed among their several ionization stages. This is what Saha's equation is concerned with.

---

This page titled [8.1: Introduction](#) is shared under a [CC BY-NC 4.0](#) license and was authored, remixed, and/or curated by [Jeremy Tatum](#) via [source content](#) that was edited to the style and standards of the LibreTexts platform.