

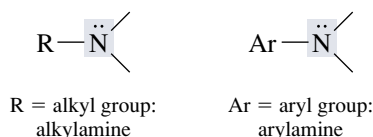
CHAPTER 14

AMINES

CHAPTER OUTLINE

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Nitrogen-containing compounds are essential to life. Their ultimate source is atmospheric nitrogen which, by a process known as **nitrogen fixation**, is reduced to ammonia, then converted to organic nitrogen compounds. This chapter describes the chemistry of **amines**, organic derivatives of ammonia. **Alkylamines** have their nitrogen attached to sp^3 -hybridized carbon; **arylamines** have their nitrogen attached to an sp^2 -hybridized carbon of a benzene or benzene-like ring.



Amines, like ammonia, are weak bases. They are, however, the strongest uncharged bases found in significant quantities under physiological conditions. Amines are usually the bases involved in biological acid–base reactions; they are often the nucleophiles in biological nucleophilic substitutions.

Our word “vitamin” was coined in 1912 in the belief that the substances present in the diet that prevented scurvy, pellagra, beriberi, rickets, and other diseases were “vital amines.” In many cases, that belief was confirmed; certain vitamins did prove to be amines. In many other cases, however, vitamins were not amines. Nevertheless, the name **vitamin** entered our language and stands as a reminder that early chemists recognized the crucial place occupied by amines in biological processes.