Phospholes and Phosphine-Acetylenes: Overview of this Thesis
Chapter 1: Overview

Phospholes and Phosphine-Acetylenes: Overview of this Thesis

1.1. Introduction
Being neglected for several decades, phosphorus is now being introduced in \( \pi \)-conjugated molecular frameworks with great success. Research in this respect has mainly focused on the phosphole ring, but other phosphorus-containing unsaturated moieties, such as the phosphine-acetylene unit, are also employed.

This thesis is dedicated to the synthesis and spectroscopic and computational analysis of novel phosphorus-containing \( \pi \)-systems, based on the phosphole (structure on the left) and the phosphine-acetylene (structure on the right) building blocks.

1.2. Overview of this thesis
This thesis commences with two literature chapters. Chapter 2 gives an overview of the most important developments and the current status of phosphole-containing \( \pi \)-conjugated materials. Chapter 3 provides a literature review on macrocycles and cages containing the phosphine-acetylene building block, with great emphasis on the \( \pi \)-conjugated ones.

Chapter 4 contains the contribution to the field of 2,5-bisaryl-phosphole based \( \pi \)-systems. Herein, the introduction of azide moieties in these systems is described, which provides a handle for easy extension of the \( \pi \)-conjugated framework and as such fine-tuning of the photophysical properties thereof.

The subject of chapter 5 is related to the field of fused phosphole-containing ring systems, in which an elegant synthetic route towards asymmetrically bridged trans-stilbenes is described, containing both a sulphur and a phosphorus atom. Moreover, differently sized substituents on phosphorus are used to influence the photophysical properties by tuning the participation of the phosphorus lone pair in the \( \pi \)-system.

In chapter 6, the attention shifts towards the phosphine-acetylene building block. This chapter describes the synthetic attempts towards asymmetric macrocycles, in which two 1,2-bisethynylbenzene moieties are bridged by phosphorus and a different heteroatom.