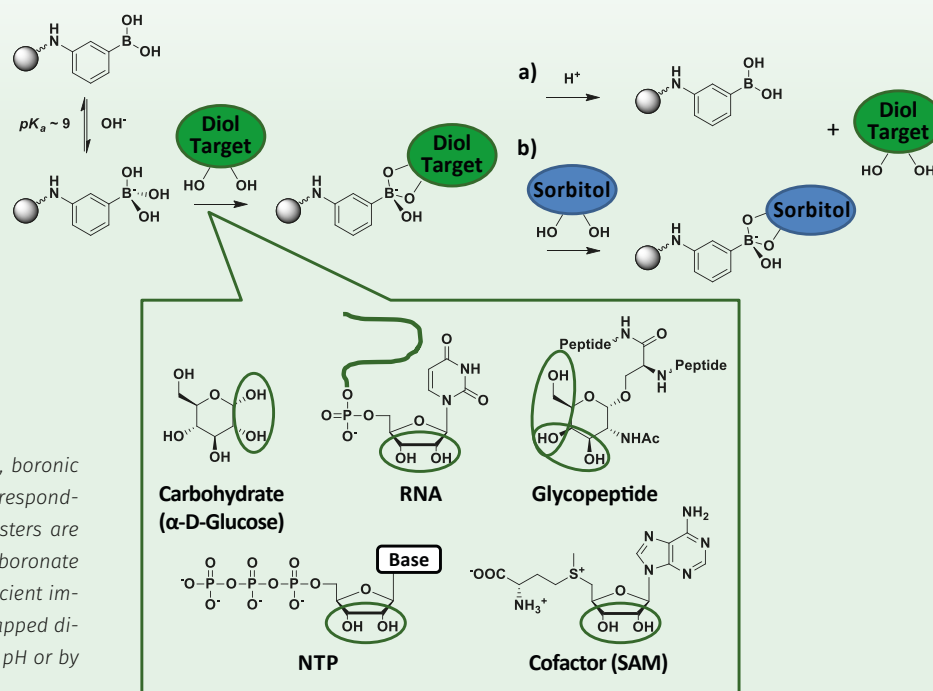


Catch and Release of Diols with Boronic Acid Agarose

Nucleotides, cofactors and glycoproteins are metabolic derivatives of carbohydrates. Chemically, they share the presence of cis-1,2- and 1,3-diols as common functional groups. When exposed to boronic acids at a suitable pH, diols are converted into stable boronate esters (Scheme 1).^[1] The immobilization of boronic acids on solid support offers a versatile approach to isolate a diverse set of biomolecular diols from complex mixtures, ranging from small molecules^[2] to entire glycoproteins^[3] and RNAs^[4,5]. Amongst the solid support available, agarose stands out for its large exclusion limit ($1 \times 10^4 - 4 \times 10^5$ Da) and therefore permits the efficient complexation of polymeric biomolecules.^[6,7] Capitalizing on the reversibility of boronate ester formation, captured compounds can be easily retrieved under mild conditions for further applications or analysis.



Scheme 1

Depending on the pH of the surrounding, boronic acids coexist in equilibrium with their corresponding boronates ($pK_a \sim 9$). While boronic esters are prone to fast hydrolysis, their tetragonal boronate counterparts are stable and allow the efficient immobilization of cis-diol functionalities. Trapped diols are either released by a) lowering the pH or by b) replacement with sorbitol.

Product	Cat.-No.	Size	Price (€)
Immobilized m-Aminophenylboronic acid	AC-160	5 ml	103,00

Selected References

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- [2] Weith et al. (1970) Synthesis of cellulose derivatives containing the dihydroxyboryl group and a study of their capacity to form specific complexes with sugars and nucleic acid components. *Biochemistry*. **9**: 4396
- [3] Mallia et al. (1981) Preparation and use of a boronic acid affinity support for the separation and quantitation of glycosylated hemoglobins. *Anal. Lett.* **14**: 649
- [4] Schott et al. (1973) Dihydroxyboryl-substituted methacrylic polymer for the column chromatographic separation of mononucleotides, oligonucleotides, and transfer ribonucleic acid. *Biochemistry*. **12**: 932
- [5] Nübel et al. (2017) Boronate affinity electrophoresis for the purification and analysis of cofactor-modified RNAs. *Methods*. **117**: 14.
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- [7] Grundy et al. (2016) PARP3 is a sensor of nicked nucleosomes and monoribosylates histone H2B(Glu2). *Nat. Commun.* **7**: 12404



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