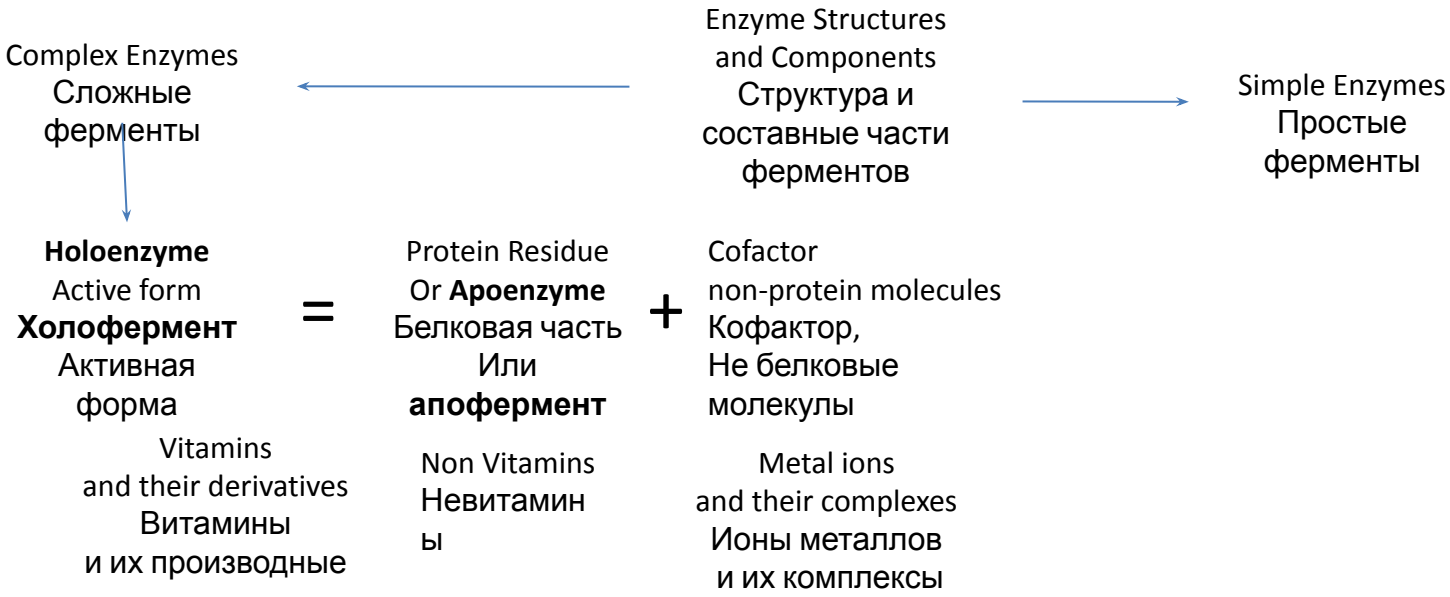


Coenzymes are not covalently attached to an enzyme, but are very tightly bound. During reaction coenzyme chemically changed and released. Initial form of coenzymes is regenerated in second, independent reaction. Since coenzymes are chemically changed as a consequence of enzyme action, it is useful to consider coenzymes to be a special class of substrates, or second substrates, which are common to many different enzymes.

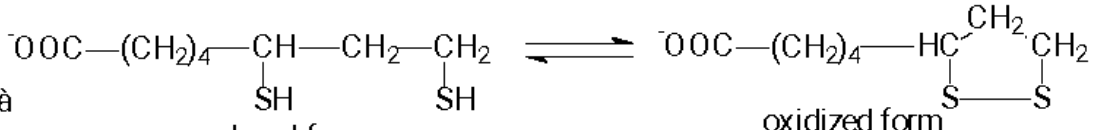
Кофермент не связан ковалентно с ферментом, но присоединяется во время реакции к молекуле фермента подобно субстрату, химически изменяется и затем снова освобождается. Первоначальная форма кофермента регенерируется во второй, независимой реакции.

Prosthetic groups can be covalently bound to enzyme and does not leave enzyme during reaction. The group which have been bounded to coenzyme is transferred to next substrate or other coenzyme molecule.

Простетические группы прочно связаны с протеиновой молекулой фермента и во время реакции ее не покидает. Группа, связавшаяся с коферментом, далее переносится на следующий субстрат или другую молекулу кофермента

1. Vitamins
Âèòàì èí û

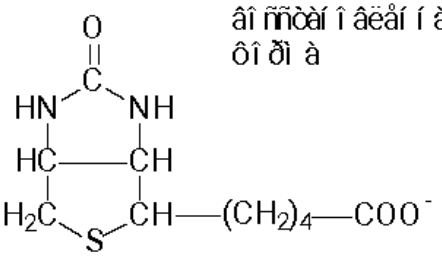
a) Lipoic acid
Ëèï îåâàÿ êèñëîòà

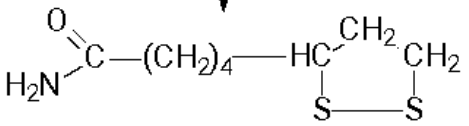


reduced form
âîññòàíîâëåííàÿ
ôîðìà

oxidized form
îêèñëåííàÿ
ôîðìà

b) Biotin
Áèîòèí

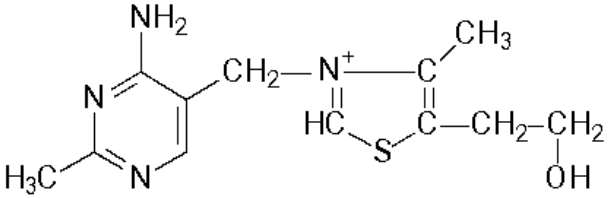




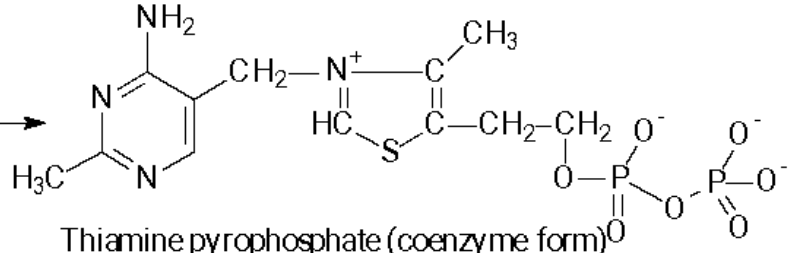
Lipoamide - Coenzyme form
Ëèïîàìèä - êîýíçèìíàÿ ôîðìà

2. Phosphoric acid esters of vitamins
Ñëîæíûå ýôèðû âèòàìèíîâ è ôîñôîðíîé êèñëîòû

a) Thiamine pyrophosphate
Òèàìèí ïèðîôîñôàò

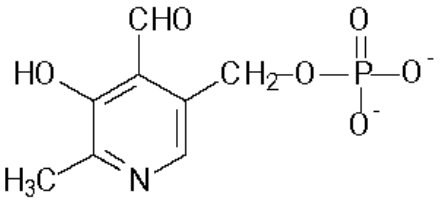


Thiamine - vitamin B_1
Òèàìèí - âèòàìèí B_1

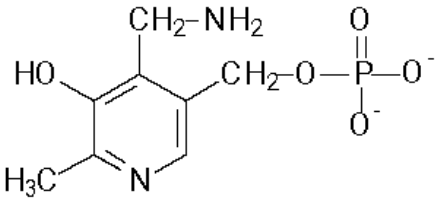


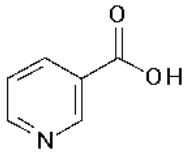
Thiamine pyrophosphate (coenzyme form)
Òèàìèí ïèðîôîñôàò (òèàìèí äèôîñôàò, êîôåðìåíòíàÿ) - êîýíçèìíàÿ ôîðìà

b) Pyridoxal phosphate
Ï èðèäîêñàëü ôîñôàò

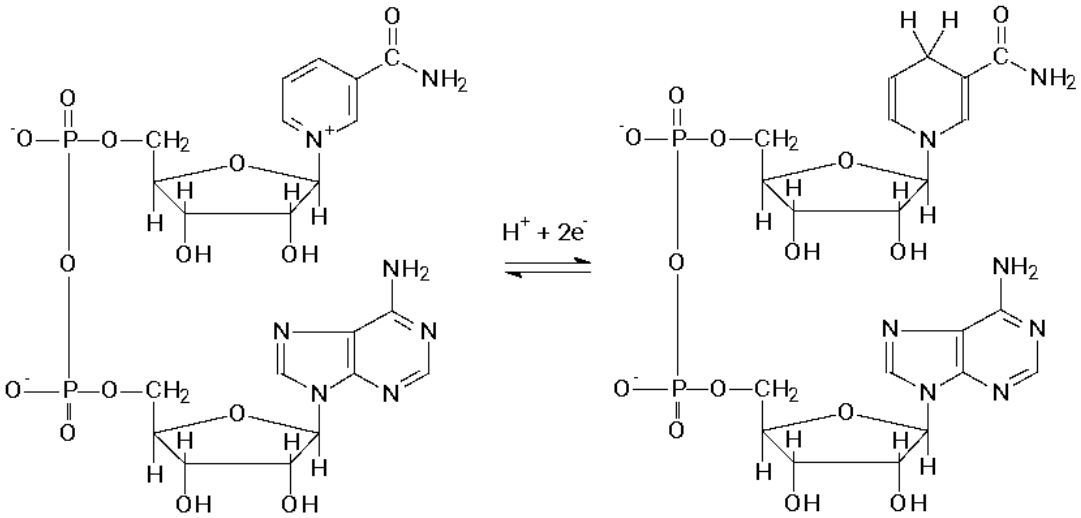


b) Pyridoxamin phosphate
Ï èðèäîêñàì èí ôîñôàò



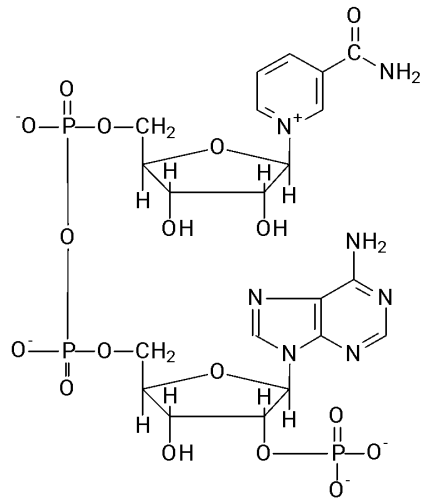


Nicotinic acid, niacine, Vitamin B_5 or Vitamin PP
Í èêîòèíîâàÿ êèñëîòà, íèàöèí, âèòàìèí B_5 èëè âèòàìèí ÐÐ

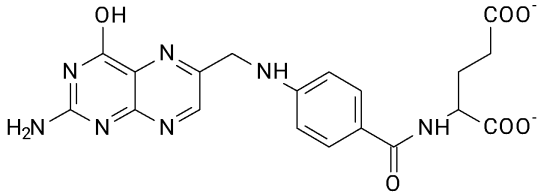


Nicotinamide adenine dinucleotide, abbreviated NAD^+
Í èêîòèíàìèä àäåíèí äèíóêëåîòèä, Í ÀÄ$^+$

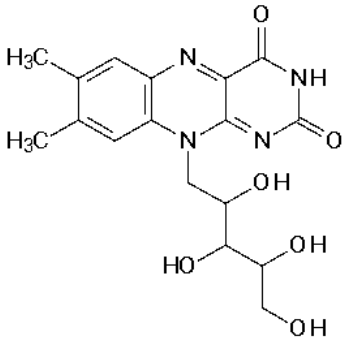
NADH
Í ÀÄÍ



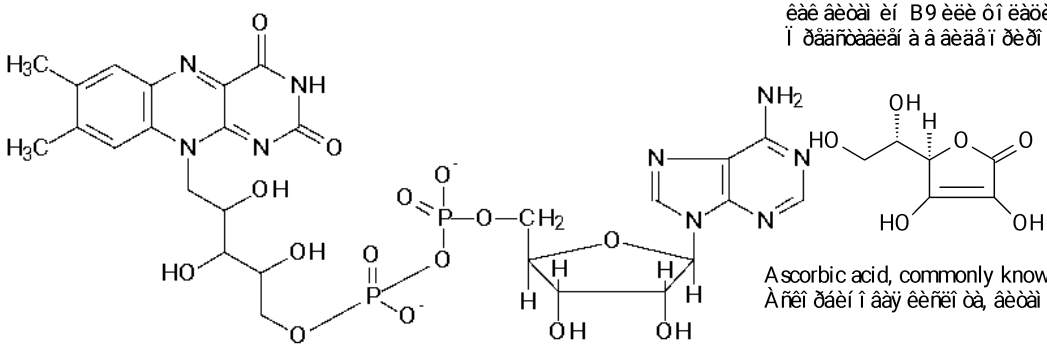
Nicotinamide adenine dinucleotide phosphate, $NADP^+$
Í èêîòèíàìèä àäåíèí äèíóêëåîòèä ôîñôàòèä Í ÀÄÔ$^+$



Folic acid, also known as vitamin B_9 or folacin, as folate, the naturally occurring form.
Ôîëèåâàÿ êèñëîòà òàêæå èçâåñòíàÿ êàê âèòàìèí B9 èëè ôîëàöèí.
Ï ðåäñòàâëåí à â âèäå ï ðèð äí î é ôî ðì û - ôî ëàòà

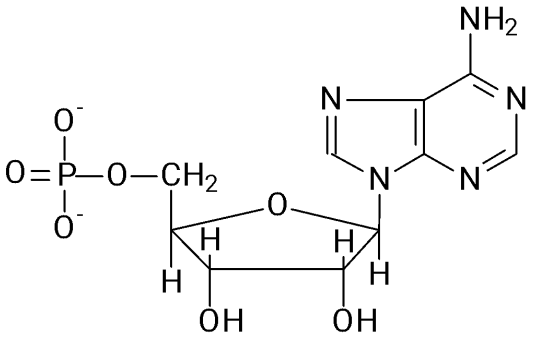


Riboflavin, also known as vitamin B2,
Ðèáîôëàâèí èëè Âèòàìèí B_2

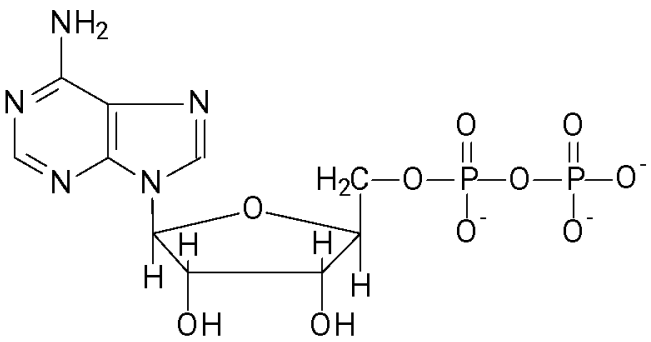


Flavin adenine dinucleotide (FAD)
Ôëàâèí àäåíèí äèíóêëåîòèä (ÔÀÄ)

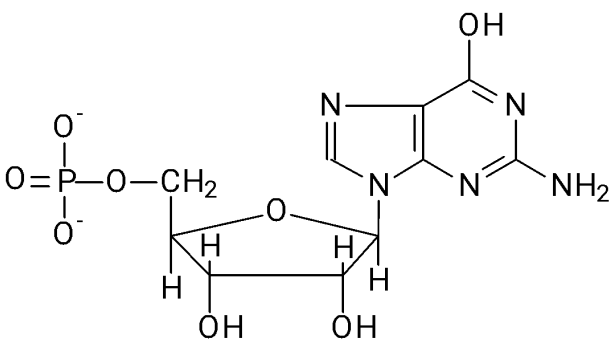
Ascorbic acid, commonly known as vitamin
Àñêîðáèíîâàÿ êèñëîòà, âèòàìèí Ñ



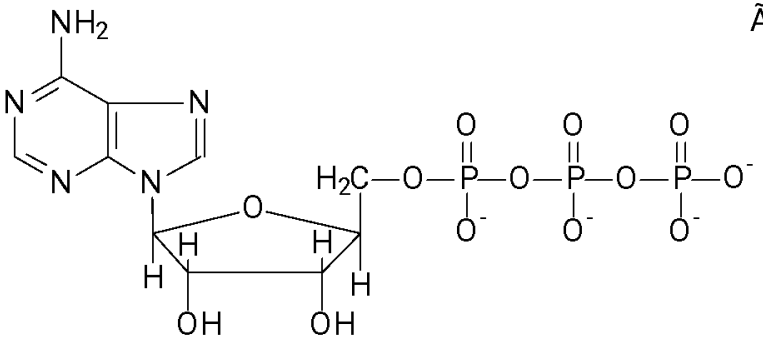
Adenosine monophosphate (AMP)
5'-Adenylic acid
Аденозинмонофосфат (АМФ)



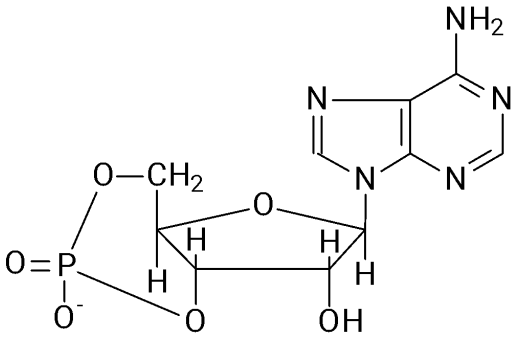
Adenosine diphosphate (ADP)
Аденозиндифосфат (АДФ)



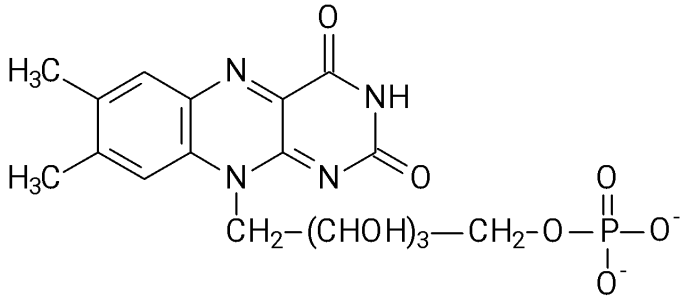
Guanosine monophosphate (GMP)
5'-Guanylic acid
Гуанозинмонофосфат (ГМФ)



Adenosine triphosphate (ATP)
Аденозинтрифосфат (АТФ)



cyclo-Adenosine monophosphate (cAMP)
циклический-Аденозинмонофосфат (цАМФ)



Flavin mononucleotide (FMN)
Флавинмононуклеотид (ФМН)

Metal ions
and their complexes

Ion	Examples of enzymes containing this ion
Cupric	Cytochrome oxidase
Ferrous or Ferric	Catalase Cytochrome (via Heme) Nitrogenase Hydrogenase
Magnesium	Glucose 6-phosphatase Hexokinase
Manganese	Arginase
Molybdenum	Nitrate reductase
Nickel	Urease
Selenium	Glutathione peroxidase
Zinc	Alcohol dehydrogenase Carbonic anhydrase DNA polymerase

Ионы металлов
и их комплексы

Ион	Примеры ферментов содержащих этот ион
Медь	Цитохром оксидаза
Железо	Каталаза Цитохром (посредством Гема) Нитрогеназа Гидрогеназа
Магний	Глюкозо-6-фосфатаза Гексокиназа
Manganese	Аргиназа
Молибден	Нитрат редуктаза
Никель	Уреаза
Селен	Глутатион пероксидаза
Цинк	Алкоголь дегидрогеназа Карбоангидраза ДНК полимераза