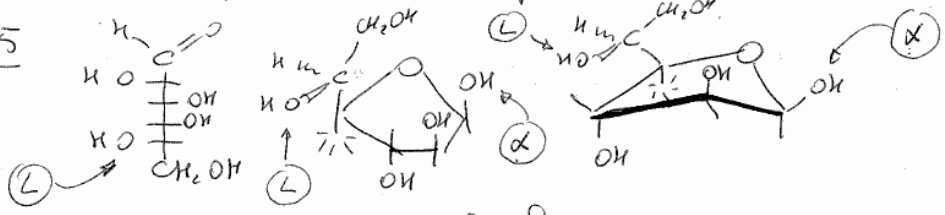
20-11-2013 5ª COMPITO DI ORGANICA

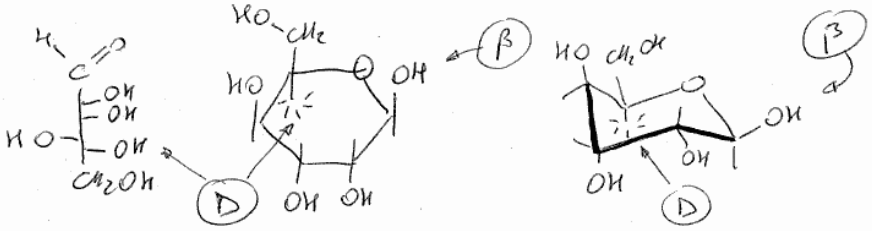
1) Scrivi le strutture di Fischer, Haworth e conformazionali:

L-galattosio → α, 5



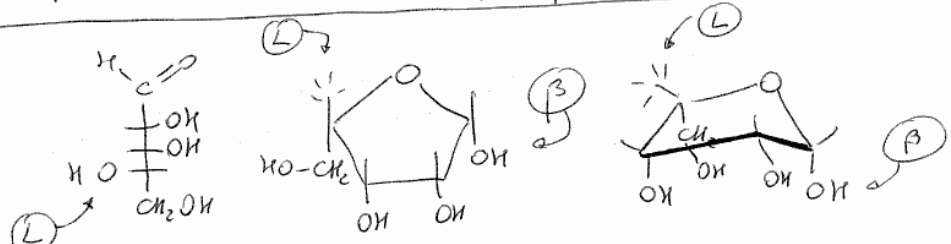
L-galattosio α-L-galattofuranosio

D-gulosio → β, 6



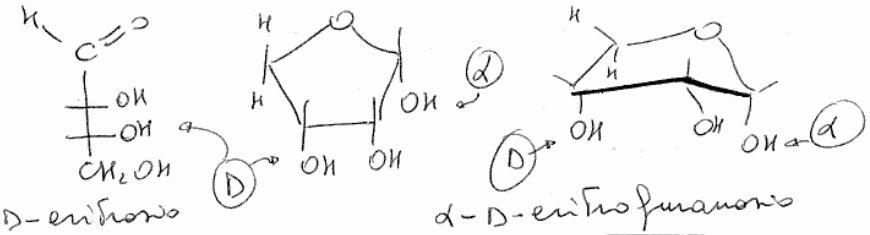
D-gulosio β-D-gulopiranosio

L-lixosio → β, 5



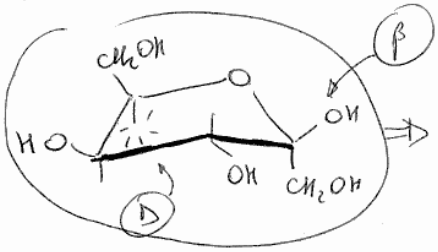
L-lixosio β-L-lixofuranosio

D-eritrosio → α, 5

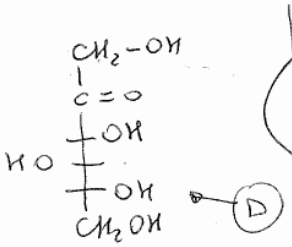


D-eritrosio α-D-eritrofuranosio

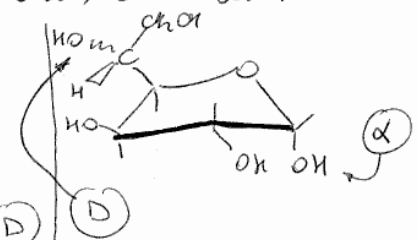
2) Scrivi la struttura di Fischer e i nomi di:



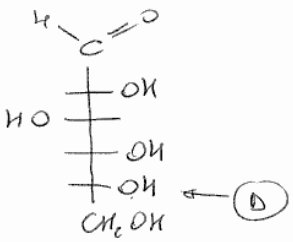
β-D-sorbofuranosio



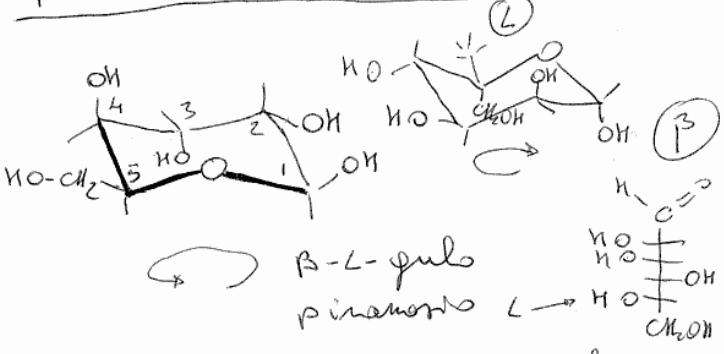
D-sorbosio



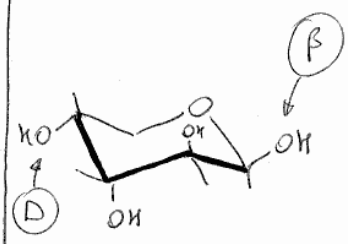
α-D-glucofuranosio



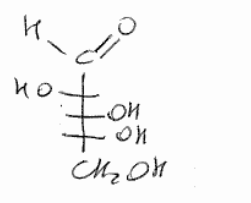
D-glucosio



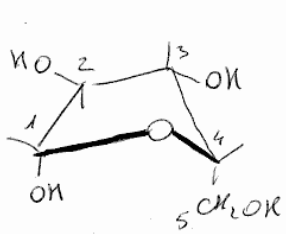
β-L-gulopiranosio L-gulosio

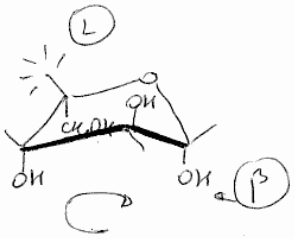


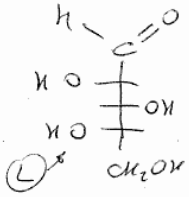
β-D-arabinopiranosio



D-arabinosio

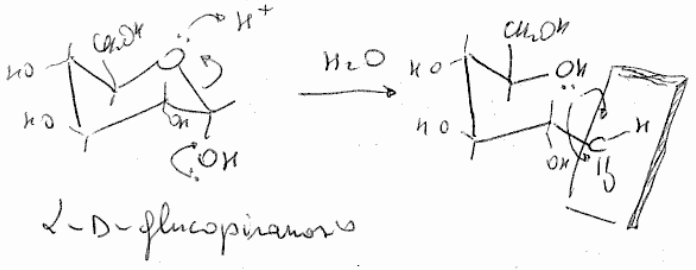




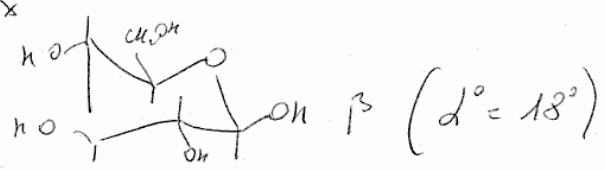


β-L-xilopiranosio — stessa rotazione — L-xilosio

3) Mutarotazione: La mutarotazione è un fenomeno che si osserva al polarimetro quando si legge il potere rotatorio di una soluzione di zucchero preparata di fresco. Il potere rotatorio della soluzione cambia continuamente fino a portarsi, dopo circa un ora, al valore di equilibrio. Lo zucchero cristallino è un anomero puro (α o β) e quando viene sciolto in H_2O ci permette di determinare il potere rotatorio di quell'anomero puro. Mentre in soluzione si stabilisce l'equilibrio $\alpha \rightleftharpoons \beta$ il potere rotatorio cambia progressivamente fino al valore finale di equilibrio.



α ($\alpha^\circ = 112^\circ$)



β ($\alpha^\circ = 18^\circ$)

4) Se uno zucchero x ha $\alpha^\circ = 87^\circ$ per l'anomero α e $\alpha^\circ = 115^\circ$ per β e la soluzione finale ha $\alpha^\circ = 91^\circ$. Calcolare % di α e β all'equilibrio

$x \cdot 87 + (1-x) \cdot 115 = 91$ $\quad 87x + 115 - 115x = 91$

$115x - 87x = 115 - 91$ $\quad 28x = 24$ $\quad x = 0,857$ $\quad \alpha = 85,7\%$

$\beta = 100 - 85,7 =$ $\quad \beta = 14,3\%$