

# LP Blending Model

- S-Stream, index s
- S-Products, index p
- V-Quantity Stream In Product  $s, p$

- P-Price Product p
- P-Min Octane Product p
- P-Max Benzene Product p
- P-Max RVP Product p
- P-Min RVP Product p
- P-Cost Stream s
- P-Avail Stream s
- P-RON Stream s
- P-MON Stream s
- P-RVP Stream s
- P-Benzene Stream s
- P-Octane Stream s

\* Octane Restriction: the octane contribution of all streams s should be greater than the minimum octane spec. of each product.

$$\sum_s V\text{-Quantity Stream In Product } s, p - P\text{-Octane Stream } s \gg P\text{-Octane Product } p, \forall p. \Rightarrow$$

$$\sum_s V\text{-Quantity Stream In Product } s, p$$

$$\sum_s V\text{-Quantity Stream In Product } s, p (P\text{-Octane Stream } s - P\text{-Min Octane Product } p) \gg 0, \forall p.$$

\* The same holds for benzene.

$$\sum_s V\text{-Quantity Stream In Product } s, p (P\text{-Benzene Stream } s - P\text{-Max Benzene Product } p) \leq 0, \forall p.$$

\* For the Reid Vapor Pressure, the mixing rule is as follows:

$$\sum_s V \cdot \text{QuantityStreamInProduct}_{s,p} (P_{RVP\text{Stream}_s}^{1.25} - P_{\text{MinRVPProduct}}^{1.25}) \geq 0, \forall p$$

$$\sum_s V \cdot \text{QuantityStreamInProduct}_{s,p} (P_{\text{MaxRVPProduct}}^{1.25} - P_{RVP\text{Stream}_s}^{1.25}) \leq 0, \forall p$$

\* The amount of each stream is limited by its availability:

$$\sum_p V \cdot \text{QuantityStreamInProduct}_{s,p} \leq P_{\text{AvailStream}_s}, \forall s$$

$$= 9V, \text{ quantityStream}_{0,9} \leq \frac{\text{quantityStream}_{0,9} - q_{\text{streamIn}} \cdot \text{quantityStream}_{0,9}}{q_{\text{streamIn}} \cdot \text{quantityStream}_{0,9} - \sum_i \text{quantityStream}_{i,0}}$$

$$0 \leq \text{quantityStream}_{0,9} - \sum_i \text{quantityStream}_{i,0} \leq q_{\text{streamIn}} \cdot \text{quantityStream}_{0,9} - \sum_i \text{quantityStream}_{i,0} \cdot V \sum_i$$

Ab.

$$9V, 0 \leq (\text{quantityStream}_{0,9} - \sum_i \text{quantityStream}_{i,0}) \leq q_{\text{streamIn}} \cdot \text{quantityStream}_{0,9} - \sum_i \text{quantityStream}_{i,0} \cdot V \sum_i$$