



**What actually makes a
flotation reagent
cost-effective?**



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It's not the price per kilogram. It's how much **extra value per tonne of ore** the reagent helps you create. In other words, a reagent should be judged by the money it makes (or saves), not by its sticker price.

How to judge it (simple checklist):

- 1. Compare apples with apples.** Look at **cost per tonne of ore at the dose you'll run**, and, if it's a blend, also consider the cost per kg of active ingredient.
- 2. Performance first.** Does it increase **recovery**, maintain or improve grade, and **remain selective** (less waste reporting to concentrate)?
- 3. Plant knock-on effects.** Will it speed up processing, reduce cleaner load, perform well in your water and pH conditions, keep froth controllable, and make filtering/settling easier?
- 4. Safety and compliance.** Easier handling, fewer hazards, and lower effluent treatment requirements often translate into lower total cost in real life.
- 5. Prove it.** Run a short A-B-A-B (or parallel line) trial over several residence times using composite samples, then compare the economics: **value gained per tonne minus cost per tonne**.





How to judge it (simple checklist):

- **Organic carbon** can “steal” reagents, create overly stable froth, and pull waste into concentrate. Managing it can reduce both dosage and treatment cost.
- The **right chemistry beats more chemistry**. On difficult or oxidised ores, modern collectors and depressants often improve both recovery and grade while reducing mass pull, freeing up cleaning capacity.
- Swapping a **high-dose, hard-to-handle** chemical with a **targeted, safer** option can reduce consumption, improve stability, and reduce operational risks.

Back-of-the-napkin maths:

- If a collector runs at **35 g/t** and costs **R60/kg**, the reagent costs about **R2.10 per tonne of ore** (0.035×60).
- If your plant earns roughly **R500 per 1%-point of recovery per tonne**, then a 0.3%-point recovery lift is worth **~R150 per tonne**.
- Net impact: **~R150 – R2.10 ≈ R148 per tonne** before considering any secondary effects. That’s what “cost-effective” looks like.



Bottom line:

A “cheap” reagent that hurts selectivity or creates downstream problems is expensive. The best reagent is the one that reliably maximises value per tonne of ore under your actual plant conditions, proven with a clean plant trial - then the price tag makes sense.