

PART 3 – AROMA CHEMICALS from PETROCHEMICAL FEEDSTOCKS

11 TECHNICAL OPTIONS

11.1 Parahydroxybenzaldehyde

The overall pHB process has been demonstrated at pilot scale on a Merisol type MP99 feedstock. Both MP96 and MPX feedstocks have been evaluated, but this has been done on a much more limited experimental scale.

The pHB process flowsheet incorporates two novel process units – an oxidation reaction and the solvent extraction recovery of m-cresol. Both of these units have been developed up to pilot scale. A 750 litre oxidation reactor has been trialled and the reactor configuration has been trademarked as the SAFOX™ reactor. A disc column solvent extraction unit has also been developed and tested at the pilot scale. This unit has been trademarked as VIPEX™.

The rest of the flowsheet involves the use of fairly standard process equipment. One of the process risks is associated with the flowsheet is the recycle of organic solvent streams. One of these is the methanol recycle system (methanol is the solvent used in the oxidation reactor) and the other is the toluene recycle system (toluene is used in the solvent extraction recovery of the m-cresol). Owing to pilot plant limitations, both recycle systems have been assessed on a limited number of recycle cycles.

Sufficient development work has been done to complete a full design specification of a pHB plant to be supplied with a MP99 type feedstock, which has an m:p ratio of 50:50. Some further directed test work would need to be carried out to fully specify a plant based on either MP96 or MP99 with a 60:40 m:p ratio. Although MPX has been evaluated on a pilot scale, sufficient work has not been carried out to demonstrate fully the process impact of the xylenols. The initial results have indicated lower yields of pHB compared to the use of MP99.

11.2 p-Anisaldehyde

The pAA process starting with pHB to produce crude pAA is a conventional flowsheet with standard process equipment, and does not pose any major process risks. The process has been fully developed at pilot scale. The only process issue is the choice of methylating agent which would affect the flowsheet configuration. The production of flavour grade pAA, however, incorporates a novel distillation unit. This unit has been trialled at the bench scale level from a supplier of proprietary equipment. Further work might have to be undertaken to finalise the design of the distillation unit.

11.3 Octylmethoxycinnamate

The CSIR has not developed any OMC technology. This technology would have to be licensed or developed depending on the time scale for implementation.

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11.4 Menthol

The process for the conversion of thymol to menthol has been developed to the level of early stage pilot scale development. Further pilot plant development work will be necessary before a commercial scale plant can be designed and fully specified. The CSIR has produced 0.5 tons of menthol for product evaluation.

The thymol front-end technology has been developed at bench scale level. Some preliminary pilot work has been undertaken, but considerable pilot work is still required.